Textile World

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CONTENTS JULY, 1935

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MANAGEMENT

Now What? (*Editorial*) 57
The Editor Says 58
Textile Industry Holds Its Own Despite Several Worries..... 59
Textile Conformance Gratifying to NRA 60
Modernize! says FHA to Industry in Extending Credit Plan.. 61
Can We Afford to Make Capital Expenditures Today? 62
Sound Distribution of Overhead Needed in Accurate Costs 68
Man in Mill Vital Factor in Conformance, S.T.A. Told 74

MERCHANDISING

Home Knitting Fad Aids Yarn Sales 64
New Promotional Booklet Boosts Tropical Worsteds 64
The Fabric's the Thing!—Paris Sets Novelty Keynote 65

MATERIALS

Germany Seeks Raw Material Independence in Rayon Staple .. 66
Cotton—U. S. Domination of World Market Seen at End 72
Wool—Likely to Hold Advanced Price Levels for Season..... 73
Cotton Maturity Determined by Microscope 89

MILL ENGINEERING

Diesel Engine as Source of Supplementary Power 84
Piping Practice—Installation and Replacement Methods 88

METHODS

Fiber-Bond Finish—Increases Durability of Textiles 71
Washboard and Its Elimination in 3-Carrier Hosiery 76
New Grabur Plant Exemplifies Latest Silk-Throwing Trend ... 77
Pointers for Novice in Dissecting Silks and Rayons 78
Simple Test to Avoid Hosiery Spots Due to Sensitive Dye 79
When to Stop Testing—Graphs Show Point for Conclusion ... 80
Harshness of Crossbreds Can be Overcome in Finishing 82
Annual Report of D-13 Shows Year of Marked Progress 83
Cotton Mill Business Like Fishing Says S.T.A. Speaker 97

DEPARTMENTS

The Overseers' Corner 86
Questions and Answers 98
Personal Page 100
New Machinery and Processes 102
New Publications and Business News 104
TEXTILE WORLD Analyst 105
Quotations 120

INDUSTRY BRANCHES

Cotton Digest 106
Wool Digest 108
Rayon Digest 110
Silk Digest 112
Knitting Digest 114
Processing Digest 116
Engineering Digest 118

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OF VALUE AND INTEGRITY

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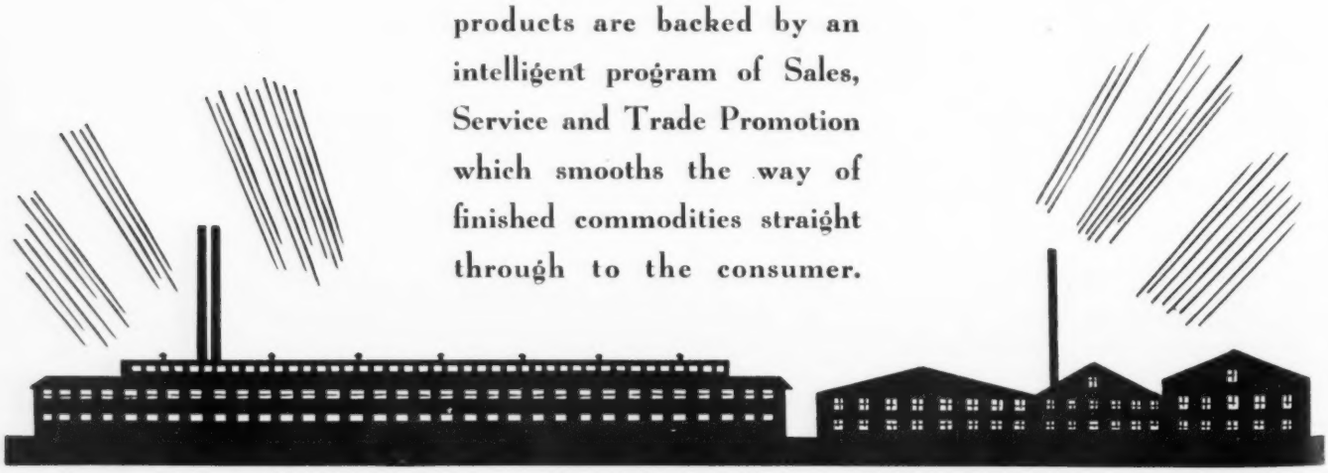


INDUSTRIAL RAYON CORPORATION

9801 WALFORD AVENUE — CLEVELAND, OHIO

Textile World

July, 1935

Editor: Douglas G. Woolf

NOW, WHAT?

THIS seems to be an appropriate time to take stock again. Reviving an old Textile World custom, we shall indulge in a semi-annual editorial inventory.

Things moved so fast during the last two years that we were forced to adjust our objectives, month by month, to a constantly changing economy. We sense the return of a greater degree of stability. That may seem strange to some who felt that the NRA decision turned things topsy-turvy. Nevertheless we believe it to be a fact.

Our reason for so believing is that we have always known we would have to return eventually to self-determination by industry.

Our "constant readers" know that we suggest none of the reactionary implications too often associated with that phrase. We have no idea that there can be a return to the laissez faire doctrine. We anticipate a constantly increasing number of safeguards to protect the public interest—and even more to the point, to protect the ethical majority of manufacturers against the less ethical minority. We believe that the aid of government in insuring those safeguards will continue to be necessary.

However, we do not believe that the bureaucratic system we built up under the NRA can be counted on as a permanent answer. Unless, of course, we are prepared to admit that private enterprise has failed. And we, personally, are not prepared to admit anything of the sort.

In fact, we believe that industry has proved definitely during the last two years that it *is* capable of a very high type of self-government . . . . We should modify that by referring specifically to the division of industry with which we are familiar: textile manufacture. Other industries undoubtedly did likewise, but we are not able to speak of or for them. We believe we can speak of and for the textile industry. And we know that textile manufacturers, individually and collectively, have exhibited industrial statesmanship. We know no higher form of praise.

So much for the background. What now?

First, it should be recognized that we are still in an emergency. Millions are unemployed. Free movement of trade, as we once knew it, has not returned. Many problems are still unsolved.

But—and this is an important "but"—we should not kid ourselves about this emergency business. One of our good friends remarked to us that an emergency ceases to be an emergency when it becomes a habit. Many of the phases of the textile emergency are habits. They have been with us for just about 13 years. They will be with us—though in a constantly decreasing degree, we hope—for some time to come. Consequently, the sane thing to do is to regard the present textile situation as more or less the basic problem we have to solve—rather than waiting for some abrupt end of an "emergency" which in fact has become a habit.

■

So again, what now?

Of all the things that should be done, there are four "musts":

1. Preservation of social gains: We doubt if most textile manufacturers realize how far they have gone in this direction. We are sure the public does not know; Gormanesque disturbances have seen to that. But the industry has progressed from a status where the work-week per employee went up to 65 hours in some cases, and where price-cutting entailed wage-chiseling which we would like to forget if we could, to a condition where the 40-hour work-week is uniform, and a minimum wage of at least "living" stature is maintained by something like 99-odd per cent of the manufacturers. That ground must not be lost. It will not be lost, if the spirit which manifested itself within 24 hours after the NRA decision is maintained. That, we insist, is No. 1 "must."

2. Continued cultivation of the merchandising factor: To the great majority of units in the industry, that still means balancing production to demand. A good job has been done in this respect under the codes. Many

groups will want to shuffle the cards. It is silly to be dogmatic about this. What is good for print cloths may not be good for, say, seasonal rayon fabrics. *But*, broadly speaking, this fact cannot be dodged: The great majority of textile groups will have to continue to rely on coordinated efforts (gentlemanly or otherwise) toward production or inventory limitation. This is one of the most fertile fields for careful study that we know . . . . Beyond that, in the truer sense of merchandising, there will be an increasing need for cooperative and individual promotion.

3. Modernization of plant and equipment: As an *individual* problem, this is probably No. 1. It is superfluous to say more about it. If you need a little cash, see page 61.

4. Prosecution of research: From an industry-wide standpoint, the activities of the Textile Foundation, the U. S. Institute for Textile Research, the American Association of Textile Chemists and Colorists, and other agencies, deserve intelligent understanding and support. From the individual standpoint, practical utilization of their findings is just good business. That ought to be enough on that.

We forgot to mention that we still have a few odds and ends to worry about, such as processing taxes, Japanese competition, and what have you. The industry should, and will, continue to fight for a square deal on these points.

But, to prevent an emergency becoming too much of a habit, we suggest continuing consideration of the above four points.

The Editor Says:

TEXTILE mill men have been so much in the limelight during recent years—commuting to Washington—writing codes—filling in questionnaires—that their activities have eclipsed those of the men who have stayed at home: the superintendents, technicians, overseers, second hands, and other operating executives.

But those men are still there: in the trenches, as it were. They have fought depression, strikes, code complications, et al. They have not always got what was coming to them. Sometimes it was due to no fault of the management; there just wasn't any more money in the till. But sometimes—too, often, we are afraid—it was due to blind cutting of corners, a frantic grasp at economy without regard for results.

Here is a tip to executives: Build these men up. Pay them as much as you can afford. Don't "shop around" for them. And, in addition to paying them, do everything to make them feel—and be—important and self-respecting parts of your organizations.

Believe it or not, it pays.

■

The AAA Amendments

THE campaign which the National Association of Cotton Manufacturers has been waging against the proposed AAA amendments is good stuff. It's surprising how few textile manufacturers knew anything about these amendments at all. The N.A.C.M. fight is important not only for its possible reaction on the Administration, but as an educational medium for its own members.

We consider the attempt of the AAA to protect itself against suits, regardless of the constitutionality of the act, one of the most brazen pieces of business we have ever encountered. The implications of such a practice are too numerous and too alarming to even contemplate. Through this method, politicians could do anything they wanted to, without fear of consequences.

The N. A. C. M. performed a service, not only to its own industry but to the country as a whole, when it turned the spot light on this particular amendment.

■

To the Editor

THE NRA editorial in your June issue is timely and to the point, and we are all particularly indebted to you for your constructive thinking. . . ."

"The NRA symposium in your last issue very succinctly set forth the true status of conditions existing at the time your paper went to press. . . ."

"I particularly want to compliment you on the editorial headed 'Please Read This.' I sincerely hope the members of the industry do read it and that they govern themselves accordingly. . . ."

"The material in your June issue sizes up conditions both as to the old NRA and as to the present situation with singular clarity. . . ."

"In the main, I think your June editorial is sound. I am a little reluctant, however, to lean on agreements made among members of an industry. As a rule these things do not work, because somebody always either breaks the agreement or gets a controlling agency—which last time was the Government, plus the Code Authority—to allow him to do something different because the something different suits his convenience. . . ."

■

This and That

BEST laugh of the month: Press dispatch says delegates purporting to represent 110,000 woolen and worsted workers attended U. T. W. meeting. Some 38,000 total U. T. W. membership was disclosed at last A.F. of L. annual meeting; of these, as you see, 110,000 are in the woolen and worsted department. . . .

Of all legislation passed within our memory, we doubt if any has been so enigmatic as the Wagner Labor Relations Act. A grand gambling-game could be made up of guesses as to its results. One thing we are sure, from a textile standpoint, is this: To be fair, or helpful, any such legislation will have to contain provisions placing some sort of responsibility upon labor unions. Otherwise, outfits like the U. T. W. can put on shows such as that of last September—and apparently get away with it. . . .

Here is a peculiar state of affairs: The Constitution has been amended 21 times. And yet, all of a sudden, it becomes something almost criminal to talk about amending it again. Those who favor a change which would permit greater uniformity, nationally, in dealing with problems affecting industry and labor, are suspected of leanings toward communism—or at least are deemed something less than 100% Americans. . . . National moods are queer things. In fact, they are sometimes almost fearful things.

SO FAR ALL'S WELL...

Textile industry holding its own despite several worries

By Douglas G. Woolf

THE textile kaleidoscope: Voluntary code conformance, with the suspense that involves. Processing tax uncertainties, plus added monstrosities in the form of AAA amendments. Sharp curtailment in cotton goods production. A synthetic labor disturbance in woolen and worsted mills. Contractual "agreements" in the making. New alignments in trade association and ex-code authority circles. Debate on French tariff negotiations. Three-shift agitation.

It adds up to rather a bewildering total.

But out of it all the industry seems to be walking, not running, to the exits.

There is no chaos—no hysteria—no panic.

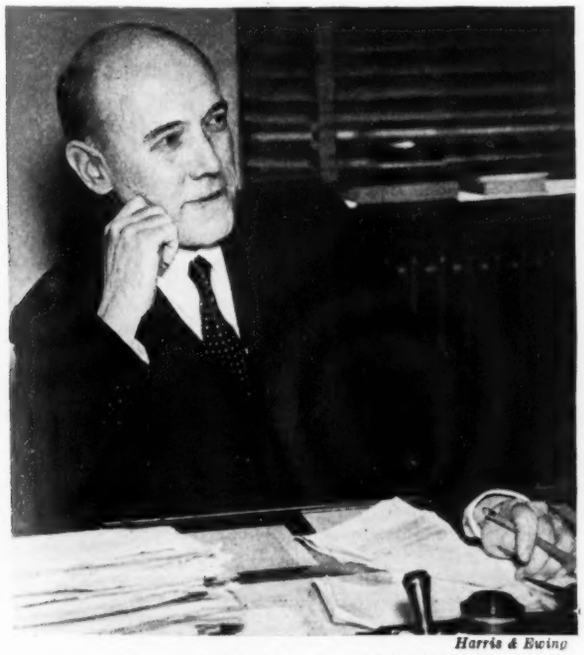
Everything is not perfect, of course. Here and there are weak spots. But so far they have not affected the rest of the barrel. If the industry can hold the line for the next month—as we are sure it will—improved business in most branches will do the rest.

Let's see what has happened since we last met—

■

NRA: As we write this, conformance to hour and wage provisions of codes has continued at a high rate in most branches of textile industry. On machinery limitation provision, third shift has been added in a few cases but these are still the rare exceptions.

Naturally, this kind of thing has involved an air of suspense and uncertainty. Each manufacturer has been more or less apprehensive of his neighbor. That is understandable, particularly in the cotton division where demand has been so sluggish. As each week passed, however, it was evident that some sort of a lesson had been learned. Just how permanent it is, remains to be seen.



Harris & Ewing

James L. O'Neill, new chief of the reorganized NRA

Agreements, to replace codes, are in the making in several branches of the industry: silk weaving, throwing, underwear, outerwear, hosiery.

Conformance committees are active in cotton industry, both North and South. In wool, "Rules of Procedure" have been submitted to industry for ratification. . . . Details of developments in the several branches of the textile industry will be found in respective Digests of this issue (pages 106 to 119).

In Washington, trend of thinking is more and more toward use of Federal Trade Commission as agency to help industry restrict unfair competition. Despite some unpleasant memories of FTC on the part of industry, it is still hoped that a new psychology will be forthcoming. At any rate, NRA and FTC are cooperating in consideration of the scope of permissible action, and of the problems of compliance. Legislation to define and make more positive the function of FTC, has been in the making in Washington during the last month. Whether it sees the light of day this session, is anybody's guess.

In another direction, "model" agreement has been drawn up by joint action of Trade Association Executives in New York City and American Arbitration Association, and submitted to executives of a large number of trade groups, for consideration.

Summing up this NRA section, it is safe to say that industry in general—and textiles in particular—have withstood the shock of the Supreme Court's decision far better than most observers anticipated—and apparently are prepared to salvage the good out of the experiment.

■

AAA: The clouds are gathering around AAA. Hardly a day goes by without at least one additional suit being filed to restrain collection of future processing taxes, or to secure refund on taxes previously paid. Cotton mills are not the only source of this unkindness; processors of other commodities are in arms. Showdown on constitutionality of these taxes is expected in the fall.

What bothers this industry most is the attempt on the part of AAA to outlaw suits for recovery of taxes, or for restraining collection of such taxes. The amendments passed by the House, and at this writing pending before the Senate, contain such provisions. This has been the target of attack from several groups, and particularly from the National Association of Cotton Manufacturers. Russell T. Fisher, secretary, calls attention to Sect. 21, paragraph (b) of the House Act and says: "This is an attempt on the part of the Secretary to continue the collection of a tax which is undoubtedly illegal, without any opportunity on the part of the tax-payer to resist collection or secure refund after the tax is paid." . . . Lincoln Baylies says: "The Secretary goes ahead se-

renely with plans to continue and strengthen a piece of legislation that has been a strong contributing factor in causing distress to hundreds of textile communities. Apparently he is proceeding on the theory that a little larger and more potent dose of poison will cure the ills of the textile industry." . . . Senator Jesse H. Metcalf, of Rhode Island, has this to say of the amendments: "This, then, is the Administration's answer to the urgent appeal of the cotton textile industry for relief from the processing tax. The tax is to be continued even though unconstitutional." . . . A resolution approved by both the Northern Cotton Mills Policy Committee and the Board of Government of the N.A.C.M. "condemned the present attempt of the Administration to circumvent the Constitution" through denial of the right to test the constitutionality of the AAA.

From all of which, the gentle reader will gather that Wallace and the industry have not yet kissed and make up.

■

Labor: The little rumpus which the U.T.W. started in Uxbridge turned out very definitely to be a trial balloon. Although ostensibly a local affair, it soon developed that it was a test case, tied in with the union's demand for a 20% wage increase in woolen and worsted mills. Apparently there was from the very beginning a determination to try for some standard minima, and the sudden substitution of such a demand for the previous 20% ultimatum, did not surprise close observers of the situation. Just how much this woolen and worsted party will prove to be a fore-runner of other textile disturbances, is not clear at this writing.

Other recent labor developments have included: The President's indefinite extension of the National Textile Labor Relations Board as mediator in labor disputes. . . . Snappy comeback by textile leaders to remark by William Green, president of A. F. of L., that wage standards created by codes were breaking down. G. H. Dorr and Earl Constantine replied.

■

Miscellany: Heavy curtailment in cotton goods should keep sanity in that market. . . . No report as yet from Cabinet Committee at this writing. . . . Textile manufacturers descended on Washington to urge against any downward tariff revisions in proposed reciprocal agreement with France. . . . A number of cotton manufacturers, both North and South, are turning to support of single 48-hour shift idea. This move bears watching.

Re Japanese competition: Dean Wallace B. Donham, writing in *Saturday Evening Post*, says: "Like other western industrial nations, we shall some day defend home industries in our home market against competition based on labor operating modern machinery for Oriental wages, *but we shall regret any delays.*" (Italics are ours.)

By the way, did you notice that legislation has been prepared in England which places the British Government definitely on record as encouraging industrial schemes for the elimination of redundant plant?

Other cosmic events of the month: Swarm of insects forced a North Carolina mill to shut down for a night . . . Paris reports a patented chemical process to render wool radioactive and claimed to "prevent and minimize rheumatism, neuritis, sciatica and other ailments."

That will be all for today.

To Sue or Not to Sue?

◆ *The rush to file suits either asking for refund of processing taxes previously paid, or seeking injunction against future collection of such taxes, indicates the belief on the part of many cotton manufacturers that it is necessary, for their own protection, to have such suits on file prior to the passage of the AAA amendments.* TEXTILE WORLD *has solicited the following opinion from AAA on this matter. It came to our Washington correspondent from Alfred D. Stedman, assistant administrator, and approved by Seth Thomas, solicitor.*

The request of the editor of TEXTILE WORLD, addressed to you and referred to this Division, has been received.

Perhaps the clearest and most convenient way of replying to his questions is to outline various hypothetical situations and indicate the status of each, in relation to suits in which it is sought to enjoin collection of processing taxes imposed under the AAA, or to recover taxes already paid under that Act.

I. The assumption that the pending amendments to the Agricultural Adjustment Act, are *not* passed.

A. Processor has *not* yet filed suit for—

1. *Refund of taxes that have been paid under protest:* The course open in this case is for the processor to file a claim for refund, with the Commissioner of Internal Revenue. Section 3226 of the Revised Statutes provides that no court shall have jurisdiction over a suit to recover taxes, until such claim has been filed, and that no suit shall be begun less than 6 months after filing of such claim, unless the Commissioner rejects the claim in less than that 6 months. The person claiming the refund has 5 years from the date of payment to file suit, and 2 years from the date of the rejection of his claim.

2. *Injunction against collection of taxes that have become due and payable:* Section 3224 of the Revised Statutes covers this case. It provides that "no suit for the purpose of restraining the assessment or collection of any tax shall be maintained in any court." Except in two cases of very unusual hardship, the Supreme Court has up to this time applied this provision literally.

B. Processor *has* filed suit for—

1. *Refund of taxes that have been paid under protest:* Under Section 3226 of the Revised Statutes this procedure is out of order since, as pointed out above, no court has jurisdiction over such a suit until after a claim for refund has been filed with the Commissioner of Internal Revenue. The course of such a person is to follow the procedure under Section 3226, first filing his claim and then bringing the suit.

2. *Injunction against collection of taxes that have become due and payable:* Under the provisions of Section 3224 of the Revised Statutes, such a suit would have no standing, since no court would have jurisdiction.

II. The assumption that the pending amendments to the Agricultural Adjustment Act *are* passed.

A. Processor has *not*, prior to the passage of the amendments, filed suit for—

1. *Refund of taxes that have been paid under protest:* Such a suit could not be maintained, because of the provision in the pending amendments under which Congress denies the taxpayer the privilege of suing the Government.

2. *Injunction against the collection of taxes that become due and payable:* Such a suit could not be maintained, since it is prohibited under the provisions of Section 3224 of the Revised Statutes, as stated above.

B. Processor *has*, prior to the passage of the amendments, filed suit for—

1. *Refund of taxes that have been paid under protest:* Such a suit would be terminated under the provisions of the amendments themselves.

2. *Injunction against the collection of taxes that have become due and payable:* Such a suit would be terminated under the provision of the amendments themselves.

There is nothing in the existing law or in the proposed amendments to the AAA which prevents any citizen from suing to determine the constitutionality of any law.

If such suits were instituted, however, and if the Supreme Court should hold unconstitutional the processing tax provisions of either the existing AAA or the proposed amendments to the Act, the same bars that have been cited above, would operate against the bringing of suits to recover any taxes that may have been paid, regardless of the constitutionality or unconstitutionality of the law, until after claim has been filed as required under Section 3226 of the Revised Statutes.

It is evident, then, that the statement of the Solicitor of the Department of Agriculture on June 30, that "whether the proposed amendments pass or not, the persons who have filed suits for the refund of processing taxes are in no better position than the persons who have not filed such suits" applies to each of the specific hypothetical cases set out above.

MODERNIZE!

Says FHA to industry, in extending credit plan

THE modernization credit plan which FHA has applied so successfully to the housing field has now been extended to include all commercial and industrial property, together with machinery and equipment. Loans up to $50,000 on each piece of property will be fully insured up to 20% of the total amount of advances by the lending institution. Interest rates and charges must be as low as consistent with the character of business in the territory where it is located and may not exceed the equivalent of $5 discount per $100 per year. Notes must be paid in equal monthly installments with a final maturity of not more than five years.

Regulations under the new amendment to the National Housing Act are now in the hands of 13,500 financial institutions which have extended $80,000,000 of credit under the $2,000 limit for home modernization. Loans under the new limit are available for repair, alteration, or improvement of real property already improved by or to be converted into apartment or multiple-family houses, hotels, office, business or other commercial buildings, hospitals, orphanages, colleges, schools, or manufacturing or industrial plants. Loans also may be obtained, with or without structural changes in the building, for the purchase and installation of equipment and machinery that are "peculiarly adapted to the business conducted therein or necessary to the operation thereof." The application of this broad ruling will be left largely to the discretion of the lending institution which advances the credit. Rulings in individual cases may be obtained from FHA if there is any question as to the eligibility of the machinery, but no attempt will be made to prepare a list of eligible items.

How to Use the Plan

Short, snappy directions for putting the plan to work have been published by *Business Week:*

"FHA has cut red tape to a minimum. If you can use its plan to buy or sell, note this simple procedure.

"Go to a bank or other financial institution that displays the 'house in a circle' sign, which means it has qualified to get FHA insurance. Or if you are selling, take your prospect there.

"Make your application in the usual manner. Drive your own bargain. The terms are up to you and the lender as far as the FHA is concerned, except that the loan should be payable in monthly installments, run not more than 5 years, carry an interest charge not exceeding the equivalent of a $5 discount per $100 face amount of a 1-year note payable in monthly installments.

"Incidentally, if you cannot find or interest a lender on your proposition go directly to FHA and it will put you in touch with a source. You needn't stop at one loan. Each individual property is entitled to $50,000 and as long as your credit warrants you can borrow as much on a dozen, or have your customer do the same thing."

Will Help Smaller Plants

Henry G. Lord, publishing director of TEXTILE WORLD, who has made a careful study of the whole question of Government loans to industry, comments on the plan as follows:

"Although the $50,000 limit means that the plan might not appeal to the larger concerns, there are undoubtedly hundreds of mills and loft factories where $50,000 would go a long way in modernizing their plants. The plan puts the Government directly in cooperation with the machinery and equipment builder in urging industry to spend money for improvement of plants. The experience of the banks who have handled the FHA $2,000 loans has been generally satisfactory, which will make them more receptive to the extension to industry.

"A feature of the loans that appeals to me is the insistence upon regular monthly payments to pay off the debt within a reasonable time. Money that has been borrowed in large amounts by industry has usually been considered more or less of a permanent mortgage on the plant without any urge to amortize quickly. The insistence on payment by installment over a comparatively short period will induce careful consideration of the purpose of the loan and its productiveness.

"There is elasticity about the whole program and I believe that if properly used by the mills and machine builders, in cooperation with the Government's efforts, it may well result in large amounts of money being released for improvement."

Can We Afford

To make capital expenditures today?

By Edwin D. Fowle
Associate Editor, TEXTILE WORLD

ECONOMIC theories can be built up to towering and even inspiring heights and come crashing down about our ears; social legislation can surge to a point where it allows for every inequality except human variability and fallibility, and can recede again; industry can co-operate to any point short of complete monopoly and return once more to free-for-all cut-throat competition; but no matter what at the moment governs the factors affecting trade practice, at least one fact remains—the manufacturer with the best tools and technique is in the best position to profit from his efforts.

That there is no escape from this truism is obvious when one considers that in days of regulation—or regimentation, if you will—efficient equipment and methods are the only means of offsetting the cost of high wages and short working hours, while in days of *laissez faire* there is no protection to the manufacturer with obsolete equipment and methods in the way of restricted production and controlled price levels. As a matter of fact, even under NRA few branches of the textile industry experienced such protection.

Furthermore, there is no cessation of progress in the development of improved tools and technique during a period of slack business. On the contrary, during the recent depression the rate of improvement very materially increased, for reasons which we outlined with considerable care on a previous occasion (TEXTILE WORLD, Dec. 5, 1931).

Since many mills lack an adequate gage for measuring the value of a contemplated improvement, it is the main purpose of this article to offer such a device. Although the reasoning will be confined to the matter of improved machinery, it must be remembered that the principles apply to betterments in buildings, improvements in manufacturing systems, and even to such less-tangible things as revisions in selling methods.

First, then, it is necessary to measure the individual benefits the improved machine offers. Following is a listing of the nine advantages commonly claimed by machine builders, together with notations as to the means available, except where obvious, for measuring each. It is improbable that all nine claims will be encountered in the case of any one machine. Furthermore, it must be expected that occasionally the result of a measurement will be zero—or even a minus quantity, indicating that a disadvantage, rather than an advantage, has been measured.

1. *Increased production* is one of the two advantages most frequently claimed today. If this factor is to be made use of to increase the total production of the plant, it can be measured partly in terms of reduced overhead per unit of product; although usually—at least when business is at so-called normal—it must be measured by comparing the increased profits to be expected with the return to be obtained from any other form of investment of the money available. If the high production is to be employed to reduce the number of machines, while giving the same total output, it must be measured in terms of lower labor cost, decreased power consumption, and reduced floor space.

2. *Labor saving* is the other most common advantage. Its measurement is obvious, but it often happens that due consideration of it cannot be confined to the benefits afforded only in the process to which the machine is to be applied. Large-package spinning, for example, saves labor in the subsequent operations; while large-beam and large-shuttle weaving saves labor in the preceding operations.

3. *Improved quality of product* closely follows the preceding two in the frequency of its importance. It must be measured in reduced seconds, fewer returns, reduced selling costs, lower overhead resulting from increased sales, and perhaps higher selling prices.

4. *Lower upkeep cost* includes an often-neglected factor—reduced shut-down time or, in other words, increased production and consequently decreased overhead. Often the savings which new machines afford in upkeep alone are sufficient justification for their installation. Mills which keep no record of the expenditures for repair on individual machines are in a poor position to measure this important factor.

5. *Reduced power cost* is not often a major advantage but is always worth considering. Occasionally a new machine increases the power load, in which case the increase must be deducted from the other advantages. Apparatus is available for testing the power consumed by any machine.

6. *Flexibility* enables a mill not only to keep abreast of style changes, but also to switch easily from one product to another as markets become unbalanced favorably for one article and unfavorably for another. This factor must be measured in terms of steady production with its elimination of high overhead peaks.

7. *Reduced floor space* can be quite important or quite unimportant, depending on what use is to be made of the space saved. If it is to be used for the installation of more machines, the gain comes in increased production and lowered overhead—after the cost of the new machines has been deducted. If it is to be used to permit the spreading out of an overcrowded department, the savings must be measured in terms of the increased efficiency in that department. Perhaps the space can be rented, a building can be torn down to save taxes, or the opportunity seized to put in that testing and research laboratory which has been so long needed.

8. *Reduced waste* of raw material and supplies is another factor the measurement of which is obvious.

9. *Reduced danger* to the worker in machine operation is not measurable in dollars and cents as a social benefit, but it can sometimes be measured in reduced insurance rates and steadier production.

The above factors, together with any disadvantages which the new machine may have in the way of higher insurance ratings, higher tax ratings, and so on, must be the basis for a comparison between the new and the old machines. Such a comparison requires considerable knowledge of how the old machine is performing; and if this information is not available, a preliminary study and analysis of the performance of the old machine must be made to develop data which can be placed against the guarantees of the machine builder. From this information can and must be developed the difference between the cost of manufacturing a unit of product with

CAN WE AFFORD, for example, to buy a new machine? The answer depends on whether the machine will pay for itself before the death knell is sounded on its useful life. To decide this point it is necessary, first, that a yardstick be slapped against each and every benefit that the machine offers. In this article we suggest the yardsticks which may be applied to the nine advantages most commonly claimed for new machines. Also, we offer a new formula, with a full explanation as to its derivation, for showing, on the basis of the measurements made, whether or not the machine is worth installing.

"It's a great machine—but can we afford to buy it?"

the new machine and with the old machine—disregarding for the time being the cost of the new machine, the interest charges on the old and new investments, and also the depreciation charges on both machines. This calculation gives *the savings in operating costs* which the new machine will effect.

With respect to the omissions mentioned, we do not include these in the estimate of savings in operating costs because they are to be made elements of the *total cost of the new machine,* a figure which must be balanced by those savings. For example, the depreciation charge on the old machine is taken care of by deducting whatever scrap value the machine may have from its book value and adding the difference to the price of the new machine. In doing this we pay off the principal of the old loan—partly by means of the income from the scrap sale and partly by means of the new loan. With the end of the old loan ends the old interest charge. (Certain conditions, of course, may make it undesirable, or even impossible, to pay off the old loan with a new loan. Such a case would arise, for example, when the loans are not from surplus but from an outside credit agency, and the new loan cannot be negotiated so favorably as the old one. When, in this event, the interest charge on the new investment is to be estimated, as it must be, the difference between book value and scrap value and the interest to be paid on that difference must be kept a separate entity from the other costs of the new machine. When the new depreciation charge is to be estimated, however, the difference between book and scrap must be included in the cost of the new machine.)

The *initial cost of the new machine* is the sum of the price, the book value (minus scrap value), and the installation expense—including the cost of adapting the mill, department, or process to the use of the new machine and the sacrifice of income resulting from the loss of production during the installation. The *total cost* includes the initial cost plus the interest and depreciation charges.

We now have the savings which the new machine will effect and the elements which make up its cost. Next, or coincidentally, the mill must decide how quickly a machine must be capable of paying for itself if it is to be worth installing. Judgment on this point has to be based on an estimate of the efficient life of the machine, this in turn to be based on depreciation due to either obsolescence or wear and tear, whichever may be expected to take effect first (in textile machinery, obsolescence usually strikes first). Although it is usual to allow a factor of safety in setting this figure, there should be little hesitation over purchasing a machine which will pay for itself in one or two years; and in many cases up to five years or more is safe.

It is obvious that in the period of time in which the machine will return its investment the accumulated savings (that is, the reductions in operating costs measured as indicated in the nine numbered paragraphs) effected by the machine will equal the total cost of the machine. This gives us, then, the following very simple algebraic equation, with x representing the number of years in which the machine will pay for itself and *Cost* representing what we have designated as *intial cost:*

Savings per unit $\times$ Units per year $\times$ x = Cost + (Cost $\times$ int. rate $\times$ x) + (Cost $\times$ dep. rate $\times$ x).

Solving for x gives the following formula*:

$$x = \frac{\text{Cost}}{(\text{Sav. p.u.} \times \text{Units p. yr.}) - (\text{Cost} \times \text{int. rate}) - (\text{Cost} \times \text{dep.rate})}$$

Let us try out the formula with a simple example. The price of a new machine is $9,100, and the equipment must pay for itself in three years. Changes which will be necessary in the layout of the department to accommodate it will cost $300. The cost of the old machine which has not been charged off into the depreciation fund—its book value, in other words—is $1,000. The figure at which the old machine can be sold is $400. Therefore, the initial cost of the new machine is 9,100 plus 300 plus 1,000 minus 400, or $10,000. The interest rate will be 6%; and the depreciation rate, 5%. (We are taking a chance in charging off the depreciation so slowly, but it is common in this matter to be more optimistic regarding the efficient life of the machine. If we have been too liberal, we shall have to add a higher book value to the cost of whatever machine eventually replaces this one). The savings per unit are $0.009, and the number of units produced per year are 1,600,000.

We are ready to employ our formula, as follows:

$$x = \frac{10{,}000}{(.009 \times 1{,}600{,}000) - (10{,}000 \times .06) - (10{,}000 \times .05)}$$

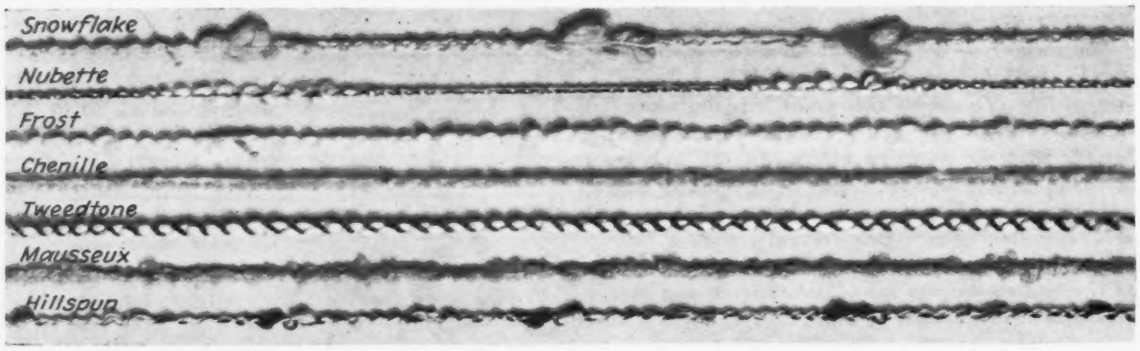
$$x = 0.75 \text{ year}$$

If we prefer to express this small figure in months, we find that the machine requires only 0.75×12, or nine months to pay for itself.

Since we have previously decided that we must purchase the machine if it will return its investment in three years, the necessity for installing it is proved. Indeed, we cannot afford not to buy the machine.

The most successful mills are those which faithfully and constantly apply some such calculation to each new machine as it comes along—and act accordingly.

*This formula can be called, for want of a better name, the "modernization formula," and it can be applied to the contemplated purchase of any new piece of equipment. Other formulas have, of course, been devised for the same purpose. The one which seems to conform most closely to this is the one which SKF Industries have developed primarily for machine tools. Application of the SKF formula to textile machinery was discussed in a recent issue of the *Hunter Counselor.*



SNOWFLAKE: Three ends, 20/1 cotton, spiral twist with a flake of roving. An extra gear with a ratchet placed on the twister frame allows the roving to stop except at intervals. Every time the gear hits the ratchet the roving is thrown in.
NUBETTE: A form of flake yarn, three ends single cotton, spiral twist with the nub of rayon.
FROST: A boucle, made of bleached cotton and roving, by twisting two ends of two-hank roving with one end of two-ply 30s yarn, then twisting with one end of single yarn.
CHENILLE: Woven as usual on chenille loom, then cut.
TWEEDTONE: Spiral twist of one end one-hank roving and two ends of 20/1 cotton yarn.
MAUSSEUX: Spun rayon twisted over core of 20/1 cotton.
HILLSPUN: Ratine yarn, variation of spiral; four strands separate colors single yarns, loosely held by a base yarn, with binder of opposite twist.

Fad Aids Yarn Sales . . .

Home-knitting outlet for novelties

By Mildred G. Barnwell,
Executive Assistant,
Southern Combed Yarn Spinners Association

FAD nothing!—it's a profession. The knitted dress craze is everywhere, and mark you, it has gone commercial. Ladies who knitted their own to enjoy the ohs and ahs of their country-club friends found with a bit of effort plus initiative they could start a nice profitable little business, and they embarked upon knitting careers.

The art of making others knit has developed countless enthusiastic adherents. Result? The country is broken out like a bad case of measles with Knit-a-Bit Shops, Wield-a-Needle Dens, and Yarn Emporiums by the dozens. Knitting instructors are in great demand and can practically name their own salaries. And last—but far from least!—alert manufacturers have found at their doorsteps a market, ready-made and flourishing, for their novelty yarns. Furthermore, believe it or not, to a woman afflicted with knititis, the price tag is negligible. The point is this: Women who knit will knit again, but *never twice on the same yarn.*

So the alert manufacturers have been making hay while the sun shines, developing new yarns to meet the demand. Above is a brief compendium of the more important new yarns. With respect to names, the terms Snowflake, Nubette, Frost, Mausseux, Tweedtone and Hillspun, are all property of the firms which developed them, and are descriptive of the yarns. Chenille, of course, is a general trade term. All of these yarns are suitable for making machine-knit garments as well as hand knitting.

"Cool Wool" . . .

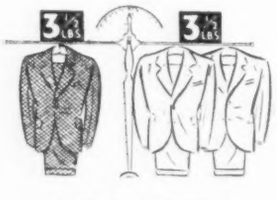
Promotional booklet boosts tropical worsteds

ONE of the early promotional efforts of the recently-organized Associated Wool Industries is a booklet featuring advantages of tropical worsteds, entitled "Cool Wool Makes Tropical Worsteds Ideal for Summer."

Appropriately illustrated, this booklet presents strong arguments for the use of wool in summer wear. It concludes with seven reasons why wool fiber is a "natural" . . . and scientific material for wearing apparel:

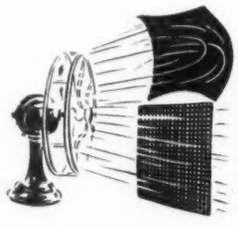
"1. Wool is perfectly elastic. . . . 2. Wool is exceedingly strong, even when wet. . . . 3. Wool is exceedingly light. . . . 4. Wool absorbs moisture without feeling 'clammy.' . . . 5. Wool is a natural thermostat. . . . 6. Wool is soft or harsh depending on its source. . . . 7. Wool means long-term economy."

The Arab's Wool burnoose gives him unfailing protection from the burning rays of the desert.



The scales tell the story—a Tropical Worsted suit weighs exactly one-half of an ordinary suit.

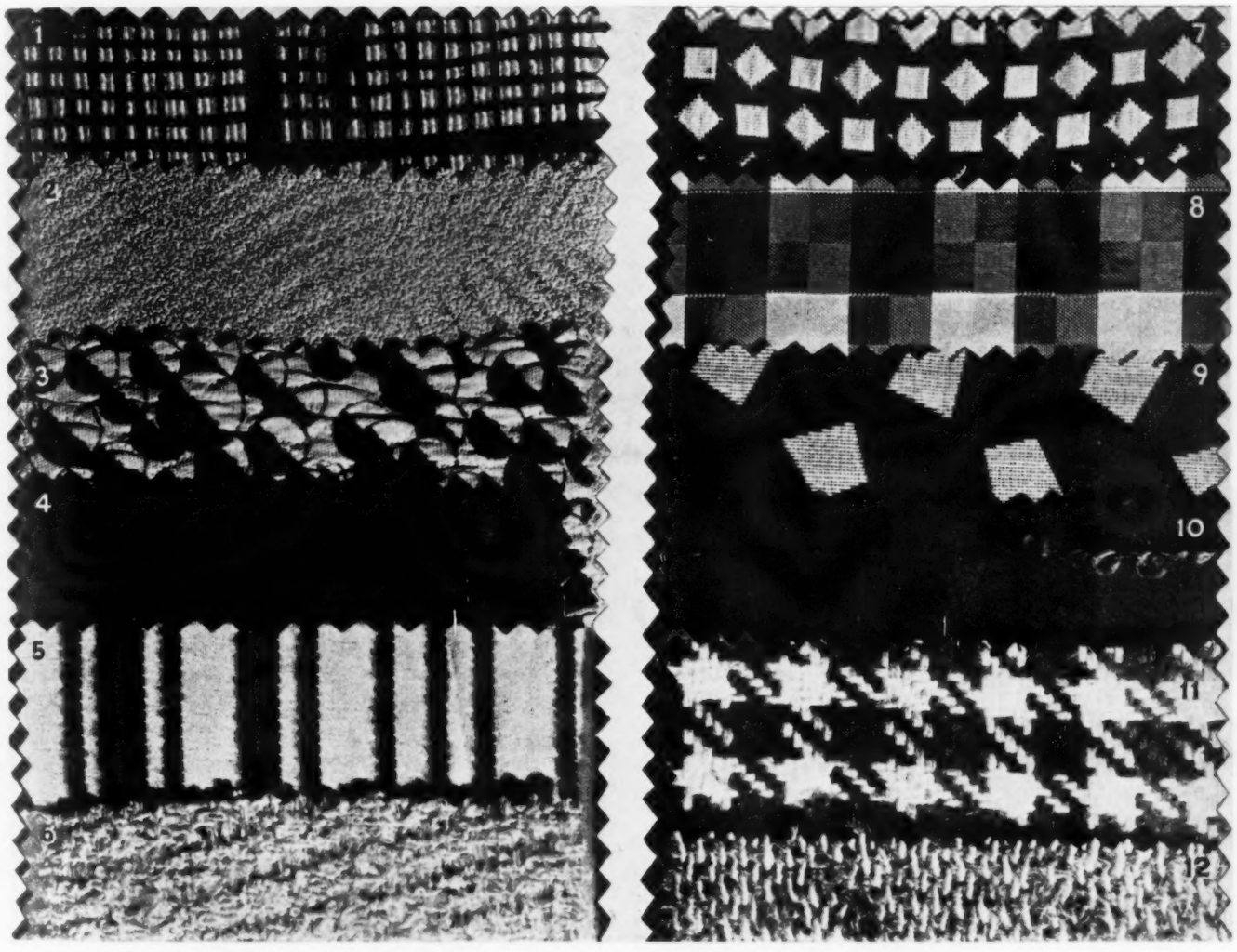
Why carry this extra weight on your back?



The porous weave allows the breeze to circulate freely through Tropical Worsted.

The Fabric's the Thing!

By Betty Hirschberg **Paris sets the keynote—which is novelty**



1. "Cordillera," a lattice print on ribbed fabric by Vermont (viscose and wool).—Courtesy DuPont Style Service.
2. "Pabrilla," swirl print on moss crepe by Thiebaut-Brion (viscose and acetate)—Courtesy DuPont Style Service.
3. "Areolyte," half-moon print on clokey by Riqueur (viscose and acetate)—Courtesy DuPont Style Service.
4. "Cotacote," Miniature Bedford cord by Chatillon Mouly Roussel (silk)
5. "Agase," wool stripes on silk ground by Tissus A.G.B.
6. "Acosta," coating of wool and linen by LeBotys (F. Carlin, art director)
7. "Rivoli," reversible rayon crepon clokey by LeBotys (F. Carlin, art director)
8. Fancy taffeta of red, black and white checks by Tissus A.G.B.
9. "Taffetalin," reversible silk and linen taffeta by Chatillon Mouly Roussel.
10. "Mohataf," silk taffeta shot with fancy red and black mohair. Chatillon Mouly Roussel
11. "Ecossais," fancy wool checked twill in autumn colors by E. Meyer & Co.
12. Tweed showing novel treatment, by E. Meyer & Co.

WHOEVER visits the model-showings of the Parisian Haute Couture always can observe the same, amusing thing: The public seems to display far more interest in the fabric than in style of make or in type of gown. As the mannequins walk by, each material is felt and examined. Questions are asked about the composition of the material. Even the lay public, especially the women, discuss eagerly the mixtures of fibers, Cellophane, Lastex, metals and feathers.

In to-day's mode, the material is the main factor. The important weavers vie with one another in daring combinations of material and fanciful designs. The materials for capes and sportswear have heavy naps; single color and multicolor boutonnés, single color and multicolor short hairs give a wealth of color to the surface. Mohair is worked up as effect threads; rayon is strikingly used; fur hairs add shagginess; metal yarns gleam; Cellophane or rubber threads add illusions.

Paris couturiers have recently shown more than the usual amount of personality and the result has been a greater diversity between the various collections themselves. Popularity of taffetas, yarn-dyed satins, failles, etc., remains strong. These relatively staple backgrounds are highly decorated and enhanced.

The specialists in woolen materials have used imagination and intelligence. One of the big successes is "Ecossais," a soft, yielding woolen resembling hand-woven combinations, with striking check patterns in three-color combinations, such as blue, white and red; gray, green and black; blue, old rose and brown.

Germany strives for raw material independence through

By Otto W. Bitzenhofer

Rayon Staple

◆ *Because of current interest in the efforts of Germany to substitute synthetic staple for the natural fibers, we asked Mr. Bitzenhofer to review the situation as it exists in his country.*

THE idea of cutting rayon filaments into staple lengths and then either spinning an all-rayon-staple yarn or mixing the staple with animal or vegetable fibers had already occurred to the young rayon industry prior to the war. In 1916 Germany was forced to seek substitutes for cotton and wool, and the then low-quality rayon had to serve as such a substitute. It was cut into any suitable staple length and spun alone, or was cut to a length equivalent to the staple of the other fiber with which it was to be mixed. When normal trading conditions returned after the war, the substitute fiber disappeared.

The ensuing years saw the quality of rayon brought to a high plane through improved mill and production control, and the cutting of filaments into staples again broadened the field of production and application. This new staple was given the name "rayon spinning fiber" to get away from the old term "staple fiber," which was in ill repute with the public because of the poor quality of the material that had served as a war-time substitute.

The first patent on the new type of staple fiber was taken out by the German dyestuff company, J. G. Farbenindustrie, in 1921 under the trade-mark "Vistra." The early fiber combined certain characteristics of cotton and rayon but was not boil-proof. Originally the staple was 3 to 4 denier, but now finer deniers of 1.2 to 1.5 are used. Naturally the staple can be cut any desired length, but until lately spinning on the cotton system has been the rule and the length has been selected accordingly. The present rayon spinning fiber has little in common with the old staple fiber, as the method of producing filament yarn that is later to be cut and spun is now different from the production of a yarn to be used in continuous-filament form.

Improvements in rayon spinning fiber have made it possible to produce staple having increased resemblance to wool, silk, and flax. The fact that Germany has no foreign money in stock to pay for imported goods and fibers has been a strong factor in promoting the use of rayon spinning fiber in all branches of the textile industry. Germany normally has to import about 650,000,000 to 775,000,000 lb. cotton, worth about 300,000,000 marks; 220,000,000 to 260,000,000 lb. of wool, worth about 260,000,000 marks; 26,500,000 lb. of flax; and 15,500,000 lb. of natural silk, although this figure dropped to 2,200,000 lb. in 1933 and rose only to 3,000,000 in 1934.

Germany produced 44,000,000 lb. of rayon spinning fiber in 1934 (*Textile Organon* quotes 20,900,000). Of this quantity, about 70% was viscose staple (usually made of Scandinavian and Finnish pulp, although German pine has been used successfully within the last few months), 20% cuprammonium staple made from cotton linters, and 10% acetate staple made from cotton waste. Production of staple in Germany is supposed to reach 60,000,000 lb. in 1935, 100,000,000 lb. in 1936, and 140,000,000 lb. in 1937. The government assists in the expansion by lending money to increase plant capacity.

Germany entertains the possibility of becoming independent of other countries that produce cotton, wool, etc. Including filament yarn in 1934 the country produced about 10% of its needs for fresh, new fiber; and in 1937 it is planned to have fiber production reach 20 to 25%

of the total fiber import, which would mean that one-third of Germany's needs for internal consumption would be taken care of. The fabric export trade has fallen off, as other countries that formerly produced raw materials primarily, are now spinning, weaving, and finishing.

Although the United States, England, France, Poland, Italy, Japan, and other countries are not in such great need of foreign-exchange money as Germany, and although most have possibilities for producing their own animal or vegetable fibers, they are producing rayon spinning fiber on a large scale.

Rayon staple was first thought of mainly as a substitute for cotton and spun silk, but it has also reduced the market for raw silk considerably. Wool and linen are also being replaced, as mixed fabrics containing 10 to 50% of rayon spinning fiber are produced. The principal characteristics of wool are its curliness and scaliness, which give elasticity to wool goods. This waviness cannot, as yet, be successfully imitated permanently in spinning staple, as imitation curls will disappear when moisture is applied.

World production of spinning staple was 90,200,000 lb. in 1934, as compared with 13,000,000 lb. in 1931. As early as 1921-1924, Germany used substantial quantities of the fiber in dress goods, velours, upholstery fabrics, etc.; but in a number of cases where a mixture was used the buyer was not appraised of the fact that the fabric contained a certain percentage of rayon staple. Later, the production of better and finer fiber made it possible to work the staple in all branches of the industry and to make all kinds of cloth. The United States started to spin staple imported from Germany in 1926.

As noted, "Vistra" was the first of the new staples; but in the last few years all German rayon concerns have started the production of spinning staple. "Cuprama" is now the standard name for cuprammonium staple and "Rhodio" for acetate. There are also a number of special products, such as "Albene" and "Zebrane," which are soft and without luster; "Linalbene," which has a dull luster; "Zebrhode," a high-luster fiber; and "Acelan," which is the acetate with the most wool-like characteristics. Most of the manufacturers produce spinning staple of high, semi-dull, and dull luster; and the fiber may be smooth, rough, or curled. The yarn may be given regular, crepe, and novelty twists.

Cloth made from spinning fiber or from mixes with cotton are, of course, on the market. Among the mixes of wool and spinning staple is "Wolstra," which is available in both yarn and cloth (the actual spinning may be done on the wool, cotton, or silk system). "Silkstra" is one of the fabrics on the market that is produced by spinning the staple on the spun-silk system.

Spinning all-staple yarn or mixes with other fibers presents few difficulties, as the regular equipment of most mills can be used. As rayon spinning staple is clean and without short staple, cleaning machinery can be eliminated. At least one or two roving operations can be dispensed with, and combing is not necessary.

Spinning staple for use on the cotton system should be 1.18 to 1.33 in. For mixing with wool, the spinning staple should be from 3.14 to 7.08 in. long, according to the grade of wool used. It is necessary to mix thoroughly the spinning staple and raw wool, moisten with an emulsion containing 5% of olive oil and 5% of soap, and then mix again before starting the spinning operation.

On the cotton system, it is preferable to use mules, as this method of spinning harms the fiber least and does not remove the waviness imparted to the spinning staple. Furthermore, a lofty yarn can thus be produced. Avoidance of anything resembling a combing action on the sliver is necessary as it is advisable to have some of the fibers remain crossed in the yarn and thus give a felt-like quality. Moistening the stock with the oil-soap solution is particularly important when handling acetate staple.

For use on the spun-silk system, the rayon staple should equal the average of the silk staple, which can range from 1.5 to 6 in. Rayon spinning fiber is successfully used even in combination with flax, where the staple may be up to 24 in. in length. However, it is not advisable to mix rayon staple with flax unless it is definitely known just what kind of cloth is to be produced and what the characteristics of the cloth should be. The introduction of spinning staple definitely reduces the solidity of the linen cloth and makes it softer. For this reason it is advisable to keep the percentage of staple in the range of 10 to 30% so the character of the cloth will not be changed too greatly.

Curling the spinning fiber is usually done by pressing with steam-heated fluted rolls. Regenerated-cellulose rayon has a smooth surface (acetate fiber is rough) and there is little sticking together of the fibers. The curling operation is intended as a substitute for the natural curl and rough serrated surface of wool. A rough-surfaced rayon fiber that has sufficient strength and good working qualities has not been successfully produced as yet. While curling increases the wool-like appearance of the staple, the curl disappears when moisture is applied. The elasticity of wool restores pressed-down places in the fabric, but fabrics of spinning staple commonly remain pressed down. This naturally reduces the bulk of the fabric, and the insulating qualities against cold or heat are decreased.

Men's-wear fabrics containing 50% combed wool and 50% rayon spinning fiber, spun to size 36s worsted, have proved quite wearable and strong. Another good mixture is 40% combed wool, 30% rayon spinning fiber, and 30% shoddy. The quality of cloth desired and the price are the determining factors in choosing a mixture.

In a later article Mr. Bitzenhofer will discuss the properties of rayon staple in more detail.

Rayon Staple-Fiber Production in Thousands of Pounds (From "Textile Organon")

Year	France		Germany		Great Britain		Italy		Japan		United States		World		Year
	Lb.	%	Lb.	%	Lb.	%	Lb.	%	Lb.	%	Lb.	%	Lb.	%	
1929	——	—	3,500	42	2,600	31	1,700	21	——	0	500	6	8,300	100	1929
1930	——	—	5,500	75	700	10	700	10	——	0	350	5	7,250	100	1930
1931	——	—	5,500	61	1,200	13	1,400	16	——	0	880	10	8,980	100	1931
1932	1,650	8	6,600	30	2,200	10	9,370	43	550	3	1,100	5	21,690	100	1932
1933	2,200	8	9,900	35	2,750	10	11,000	38	——	0	2,100	7	28,610	100	1933
1934	4,400	7	20,900	35	3,300	6	22,000	37	4,720	8	2,200	4	59,550	100	1934

Above figures are from *Textile Organon*. Mr. Bitzenhofer's are larger for Germany and the world.

Sound method of distributing overhead essential to accurate determination of

Woolen-Mill Costs

By C. W. Bennett
Cooley & Marvin, Boston

COST figures form the basis for formulating decisions that carry enormous potentialities either for good or evil. Consequently, it is imperative that the figures be correct. This does not refer simply to the mathematical computations, for there should be no question on that score. It refers instead to the fundamentals upon which the entire cost structure is based. Are these cost fundamentals such that accurate data on production and distribution costs are constantly available? Is a correct picture of the mill operations and the departmental results always on hand and in such form that the figures talk the mill man's language? Unfortunately, many mills do not possess a cost system which accomplishes these results. And it is in the development and application of burden or overhead costs that most of them seem to go astray. Material and labor costs are usually calculated with satisfactory accuracy, but the application of burden costs to the various yarns or fabrics in a manner that is at once simple and accurate, appears to constitute a problem of substantial proportions in many mills.

Actually, burden is the easiest of all cost elements to develop and apply, provided a soundly conceived and correctly developed burden plan is used. The plan set forth represents an actual case and constitutes the report made to an executive of a woolen mill, operating about 75 broad looms on suitings and overcoatings, setting forth the development of burden procedure in his plant.

The plan breaks the mill burden down to production and non-productive departments, both for accurate costing and for more effective management control. Commercial expense and other expenses, such as interest paid, are applied as a percentage of the total mill cost. It should be remembered that this plan covers the development of all costs outside of direct material and direct labor.

Development of Mill Burden—Table I reflects the final burden rates for each of the different departments. In preparing an analysis of this kind, the first step is that of determining the budget for the coming year for the entire mill, subdivided by the burden accounts maintained in the mill ledger. With the mill total burden so obtained, the results are distributed to the operating departments on some equitable basis, and for this purpose Plans 1 to 10 were prepared. A detailed explanation of these plans is given below.

Table I—Development of

Acct. No.	Name	Basis of Distribution	Total Budget	Dyeing	Picking	Carding	Spinning
501	Superintendence	Plan 1b	$6,500.00	$390.00	$455.00	$435.50	$721.50
501	Foremen	" 1a	20,724.60	2,948.40	2,948.40	3,120.00	2,106.00
502	Indirect labor	" 2b	39,076.32	.....	1,500.00	1,500.00	11,500.00
503	Repairs and Mtce. buildings	" 3	1,900.00	43.00	175.00	131.00	200.00
504	" " " mach. & equip	" 4	10,658.00	458.30	927.25	1,897.12	1,428.17
505	Mill supplies	Actual*	28,183.00	380.00	7,074.00	3,704.00	1,198.00
506	Electrical supplies & expense	Plan 9	2,167.48	41.18	481.18	238.48	179.90
507	Auto and truck expense	" 7	4,159.44	.....	.....	.....	.....
508	Light	" 5	3,392.76	81.43	454.63	193.39	227.32
	Heat	" 6	17,465.14	12,225.50	1,746.51	197.37	227.06
	Power	" 8	18,111.00	326.00	4,328.52	2,173.32	1,539.44
	Water	" 10	5,965.00	2,950.00	.....	.....	.....
	Protection	" 3	1,355.00	31.17	124.66	93.49	142.27
601	Shipping department payroll	Actual*	3,902.00	.....	.....	.....	.....
602	" " " supp. & expense	"	3,344.86	.....	.....	.....	.....
603	Freight in	To stores	15,000.00	.....	.....	.....	.....
605	General mill expense	Actual*	7,500.00	322.50	750.00	1,417.50	1,050.00
701	Insurance:						
	Fire and U. & O. bldgs. & conts.	Plan 3	7,792.59	179.23	716.91	537.69	818.22
	Paymasters robbery	Actual*	27.70	.....	.....	.....	.....
	Check forgery	"	42.75	.....	.....	.....	.....
	Automobile liability	Plan 7	221.52	.....	.....	.....	.....
	Steam boiler	Actual*	135.34	.....	.....	.....	.....
	Workman's compensation	Plan 2a	3,290.42	207.30	240.20	233.62	384.98
702	Taxes: buildings	" 3	3,139.54	72.21	288.83	216.63	329.65
	Machinery & equipment	" 4	2,096.77	90.16	182.42	373.22	280.97
	Inventory	To stores	5,976.35	.....	.....	.....	.....
703	Depreciation:						
	Buildings 3.5%	Plan 3	8,647.56	198.89	795.58	596.70	907.99
	Machinery & equipment 7.5%	" 4	15,031.25	646.34	1,307.19	2,675.56	2,014.19
	Auto trucks 25%	" 7	1,914.96	.....	.....	.....	.....
	Total		$237,721.35	$21,591.61	$24,496.28	$19,734.59	$25,255.66
	Redistribution:						
	Stores	Plan 2c	.....	2,265.92	2,452.16	2,359.05	2,762.56
	Shipping	" 2c	.....	766.51	829.52	798.02	934.52
	Mill general	" 2c	.....	481.40	520.97	501.19	586.91
	Boiler house	" 6	.....	2,036.25	290.10	33.47	36.26
	Total departmental burden	.....	$237,721.35	$27,141.69	$28,589.03	$23,426.32	$29,575.91
	Direct labor	.....	242,507.66	17,836.00	19,241.16	18,397.86	21,619.08
	Burden rates: Actual	.....	98.0%	152.0%	148.5%	127.2%	137.0%
	Recommended	.....	100.0%	150.0%	150.0%	130.0%	140.0%

*"Actual" means the expenses are capable of being charged direct to the proper department.

The entire mill expense must eventually find its way to production departments or centers of burden application only. Therefore, after the total mill budget has been distributed, the amounts applied against non-productive departments also should be prorated among the production departments. Reference to Table I will show these non-productive departments to be the following: (1) stores; (2) shipping; (3) mill general; (4) boiler house. Distribution of these four classes of expense is made in accordance with Plans 2a, 2c, 2e, and 6, respectively. Any expenses applicable to the office are carried to the commercial-expense section. The final departmental burden rates are obtained by dividing the total expense of the department by its direct labor.

At the bottom of Table I, the total direct labor is shown and the resulting burden rates, indicating the ratio of burden to direct labor. These burden rates (for example, the burden rate of 150% mentioned in your letter) are used to absorb burden against current output. All products passing through each of the departments during a given month will absorb burden on the basis of the predetermined rates applied to the actual direct labor for that month. Thus, on one hand, we have the actual burden for the month distributed to each department on an accurate and logical basis, and on the other hand, we have the amount of this burden that has been absorbed against current output on the basis of the burden rates that have been used in calculating fabric costs. This very clearly shows the burden gain or loss by departments. These burden variances are not allowed to find their way into cost figures because they have fundamentally nothing to do with the cost of production. These variances are, instead, efficiency gains or losses and as such should always be set forth. Production costs should be calculated on the basis of predetermined rather than actual costs, and it is for this purpose that the burden budget as reflected in this article is prepared. These departmental burden variances are carried direct to the monthly statement of profit and loss as part of the reason why the actual profit and loss may have varied from the anticipated profit and loss.

Commercial Expense—Table II reflects the development of commercial expense. The estimated mill cost of sales is divided into the total expense to obtain the expense rate to apply to total mill cost.

Other Expenses—In addition to the mill burden and commercial expenses, there are other items to be included before the total costs are obtained. Table III illustrates this point. It should be a rule always to include in this grouping all expense items not provided for in the mill burden or commercial expense.

A description of the plans for distributing burden to the various operating departments follows:

PLAN 1—Schedule of Superintendence and Foremen Wages.

(a) *Foremen*—The wage charges of production-department foremen are made direct. The shipper's salary of $2,002, plus a charge of $1,900 shown in Plan 2b, represents the shipping department payroll, shown in Table I. The engineer's salary of $2,527 is charged to light and power. The master mechanic's salary of $2,012 is a charge against repairs and maintenance.

(b) *Superintendence*—Included in this amount are the salaries of the superintendent, the assistant superintendent, and also a portion (one-third) of the wages of another man who assists part of the time in the superintendent's office. Distribution of the total superintendence charge is made to departments on the basis of total mill payroll, as shown by Plan 2a.

PLAN 2. Analysis of Labor (see Table 4).

(a) *Total labor*—Both the total estimated direct and

Mill Burden by Departments

Dressing & Spooling	Weaving	Burling & Sewing	Wet Finishing	Dry Finishing	Stores	Shipping	Mill General	Boiler Room	Office
$292.50	$2,483.00	$520.00	$455.00	$331.50	.....	$39.00	$377.00	.....	.....
2,059.20	3,120.00	1,474.20	1,474.20	1,474.20	.....	.....	.....	.....	.....
1,500.00	16,000.00	2,100.00	1,900.00	.....	.....	.....	3,076.32	.....	.....
116.00	242.00	83.00	192.00	80.00	$445.00	40.00	76.00	$32.00	$45.00
341.06	2,717.79	31.97	1,215.01	586.19	149.21	31.97	373.03	500.93	.....
290.00	2,124.00	57.00	12,376.00	480.00	.....	.....	500.00	.....	.....
62.86	296.94	36.85	684.92	67.19	.....	.....	34.68	43.30	.....
.....	.....	.....	.....	.....	2,495.66	1,663.78	.....	.....	.....
261.24	1,011.04	373.20	152.67	261.24	.....	.....	332.49	44.11	.....
169.42	337.10	92.57	873.26	873.26	520.49	48.90	103.05	.....	50.65
362.22	1,937.88	.....	6,646.74	398.44	.....	.....	18.11	380.33	.....
.....	.....	.....	2,950.00	.....	.....	.....	.....	65.00	.....
82.65	172.09	59.62	136.85	56.91	317.07	28.46	54.20	23.03	32.53
.....	.....	.....	.....	.....	.....	3,902.00	.....	.....	.....
.....	.....	.....	.....	.....	.....	3,344.86	.....	.....	.....
.....	.....	.....	.....	.....	15,000.00	.....	.....	.....	.....
187.50	1,717.50	7.50	885.00	420.00	33.00	15.00	267.00	427.50	.....
475.35	989.65	342.89	787.05	327.29	1,823.46	163.64	311.70	132.47	187.04
.....	.....	.....	.....	.....	.....	.....	.....	.....	27.70
.....	.....	.....	.....	.....	.....	.....	.....	.....	42.75
.....	.....	.....	.....	.....	132.91	88.61	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	135.34	.....
154.65	1,319.45	276.40	240.20	164.52	.....	69.10	.....	.....	.....
191.51	398.72	138.20	317.07	131.86	734.65	65.93	125.58	53.37	75.33
67.10	534.68	6.29	239.03	115.32	29.35	6.29	73.39	98.55	.....
.....	.....	.....	.....	.....	5,976.35	.....	.....	.....	.....
527.51	1,098.24	380.50	873.40	363.19	2,023.53	181.59	345.90	147.00	207.54
481.00	3,832.97	45.09	1,714.13	826.71	210.43	45.09	526.09	706.46	.....
.....	.....	.....	.....	.....	1,148.98	765.98	.....	.....	.....
$7,621.77	$40,333.05	$6,025.28	$34,112.53	$6,957.82	$31,040.09	$10,500.20	$6,594.54	$2,789.39	$568.54
1,520.96	12,478.12	2,824.66	2,390.09	1,986.57	.....	.....	.....	.....	.....
514.50	4,221.08	955.52	808.52	672.01	.....	.....	.....	.....	.....
323.13	2,651.01	600.10	507.78	422.05	.....	.....	.....	.....	.....
27.89	55.79	13.95	147.84	147.84	.....	.....	.....	.....	.....
$10,008.25	$59,739.05	$10,419.51	$37,966.76	$10,186.29	.....	.....	.....	.....	$668.54
11,730.92	97,441.84	21,909.24	18,848.32	15,423.24	.....	.....	.....	.....	.....
85.0%	61.4%	47.6%	201.5%	65.8%	.....	.....	.....	.....	.....
85.0%	60.0%	50.0%	200.0%	65.0%	.....	.....	.....	.....	.....

indirect labor for the entire mill are included in this plan. Resulting ratios are also presented.

(b) *Indirect labor*—A listing is made of the indirect labor costs obtained, charging each department with the actual wages paid by each for such labor. It will be noted that the sum of $16,323.68 is deducted before reaching the final figure for indirect labor. This sum includes shipping charged to shipping-department payroll, machine shop and carpenters charged to repairs and maintenance, boiler room charged to heat, electrician charged to power, and truck drivers charged to auto and truck expense. The remaining balance of $39,076.32 is entered on Table I.

(c) *Direct labor*—From this column the departmental figures used in the burden development, Table I, are obtained.

PLAN 3—Distribution of Floor Space.

Insurance plans and appraisal data were used, in addition to physical examinations, in determining the floor space chargeable to the various departments. The results are reduced to a percentage basis and accordingly serve as a means of distributing charges to which floor space distribution is applicable.

PLAN 4—Distribution of Machinery and Equipment Values.

Value of machinery in each department was listed and then reduced to a percentage of the total. These percentage figures are used in distributing all items on Table I to which Plan 4 applies.

PLAN 5—Distribution of Light Expense.

The electrical department supplied statistics from which were developed the relative proportions of kilowatts of light consumed by the several departments. Ratios were then prepared to use in distributing the light expenses.

PLAN 6—Distribution of Heating Expense.

The following distribution of heating expense was determined upon: dyeing, 70%; picking, 10; wet finishing, 5; dry finishing, 5; and general, 10. The 10% chargeable to "general" was apportioned to the several production departments on the basis of floor space.

PLAN 7—Distribution of Auto and Truck Expense.

Of the total auto and truck expense, 60% was charged against stores as transportation in, and 40% to shipping as transportation out.

PLAN 8—Distribution of Power Expense.

In preparing Plan 8, the following procedure was followed: A list was made of each motor serial number and its horsepower. Next, the load carried was ascertained; for example, a 40-hp. motor developing only 30 hp. was carrying a 75% average load. Next, the average hours that the motor runs in a week were determined. Multiplying the horsepower by the average per cent of load by the average hours run per week produced the average horsepower operating hours. Percentages were then prepared, showing the relative amounts of power consumed in each department.

PLAN 9—Distribution of Electrical Supplies.

Electrical supplies and expense are distributed to the departments on the basis of the combined light and power used. In developing these percentages, first both the light and the power were distributed. Then the two results were combined according to departments to obtain the ratios.

PLAN 10—Water Expense.

The boiler house is charged a flat amount of $65 a year for water. The balance is divided between the dyeing and wet-finishing departments.

TABLE II—Development of Commercial Expense

Folio	Name	Actual Last Year	Budget This Year
01	Officers' salaries	$41,600.00	$31,200
02	Office payroll	10,229.77	10,000
03	Stationery and office supp	1,987.67	2,000
04	Tel. tel. & postage	867.64	900
05	Office expense	.....	500
06	Traveling expense	2,410.93	2,500
07	Legal & Acctg. expense	3,581.60	3,500
08	Charity and donations	1,522.50	1,500
09	Association dues	2,918.18	3,000
011	Pensions and sick benefit	.....	1,000
015	Deprec. off. furn. & fixt	336.54	340
016	Capital stock tax	1,156.00	1,200
018	Other adm. exp	.....	500
	Total adm. expense	66,610.83	58,140
P1	Market expense	.....	1,000
P2	Commissions	61,005.17	40,000*
P5	Freight and postage out	6,000.00	6,000
P9	Credits and collections	.....	1,500
P13	Bad debts	1,133.25	5,000†
P16	Share of shipping expense	.....	1,500
P18	Other selling expense	168.48	1,000
	Total selling expense	68,306.90	56,000
	Total commercial expense	134,917.73	114,140
	Mill cost of sales (see below)	1,727,477.52	750,860
	Expense rate	7.8%	15.2%
	(Recommended)	.....	15.0%

*4% of Sales. †0.5% of Sales.

COST OF SALES:		
Sales as budgeted		$1,000,000.00
Less: Commercial	114,140.00	
Interest	35,000.00	
Profit 10%	100,000.00	
	249,140.00	
Mill cost of sales		$750,860.00

TABLE III—Development of Other Expenses

		Budgeted
N4	Interest paid	$35,000
	Total	$35,000
	Mill cost of sales	$750,860
	Expense rate (Per cent of Mill Cost)	4.7%
	Recommended	5.0%

Samples, seconds, and remnants 5% of total mill cost.

TABLE IV—Analysis of Labor

	Plan 2a: Total labor 6 months May 1 to Oct. 31	Plan 2a: Estimated total labor for year	Plan 2a: Total labor %	Plan 2b: Indirect labor	Plan 2c: Direct labor	Plan 2c: Direct Labor %
Dyeing	$8,918.00	$17,836.00	6.0	.....	$17,836.00	7.3
Picking	10,370.58	20,741.16	7.0	$1,500.00	19,241.16	7.9
Carding	9,948.93	19,897.86	6.7	1,500.00	18,397.86	7.6
Spinning	16,559.54	33,119.08	11.1	11,500.00	21,619.08	8.9
Dressing and spooling	6,645.46	13,290.92	4.5	1,500.00	11,790.92	4.9
Weaving	56,720.92	113,441.84	38.2	16,000.00	97,441.84	40.2
Burling and sewing	12,004.62	24,009.24	8.0	2,100.00	21,909.24	9.1
Wet finishing	10,374.16	20,748.32	7.0	1,900.00	18,848.32	7.7
Dry finishing	7,711.62	15,423.24	5.1	.....	15,423.24	6.4
Shipping	922.25	1,900.00	6	1,900.00	.....	.....
Mill general (sundries)	8,565.89	17,500.00	5.8	17,500.00	.....	.....
Totals	$148,741.97	$297,907.66	100.0%	$55,400.00	$242,507.66	100.0%
Less indirect items charged elsewhere:						
Shipping	.....	1,900.00				
Mill general	17,500.00	.....				
Less	3,076.32	14,423.68				
Total				$16,323.68		
Balance indirect labor account 502				$39,076.32		

Fiber-Bond Finish

New process increases durability of textiles

Regular finish after 2,500 strokes on abrasive machine

Fiber-Bond finish after 2,500 strokes on abrasive machine

FIBER-BONDING, the latest addition to the rapidly growing list of processes developed in recent years for increasing fabric serviceability, gives promise of being one of the most valuable contributions of the textile industry to the consumer. Brought to the commercial stage only a few months ago, the Fiber-Bond process is at present finding application in the finishing of shoe linings for the purpose of increasing their resistance to abrasion and hence to wear. It appears, however, that the new process will be equally advantageous for treating a wide line of cotton fabrics which are subjected to hard usage or repeated washings. Work clothing, bed linens, napped goods, pocketings, suppliers' coats and aprons, damasks, and upholstery fabrics are but a few of the materials which come to mind. Experiments indicate also that the Fiber-Bond process improves the wearing qualities of wool goods. Likewise, there seems to be no reason why the process cannot be adapted to linings and other fabrics made from rayon. The process was developed by Copeman Process Co., of Flint, Mich., and New York, after several years of research under the direction of Dr. F. E. Bartell, of the University of Michigan. About six months ago the Fall River (Mass.) Bleachery obtained a license to use this process and is now applying the Fiber-Bond finish to shoe linings, marketed through Seabury & Cushman, of Boston.

In general the process consists of so treating the fabric that the individual fibers are "bonded" more firmly to the yarn core. The treatment provides a surface to the cloth which has increased resistance to abrasion during wear or washing. The basis of the processing solution used commercially is a combination of synthetic resins. No special equipment is necessary. The process replaces the customary sizing or starching operation, and is applied after bleaching, dyeing, or printing.

Increased resistance to abrasion is effected without materially changing the hand of the goods. If desired, however, the process can be used to add body, weight, and thickness to the goods. In practice, the increase in weight ranges from 3 to 10%, depending upon the type of hand required.

In addition to increasing the resistance of the fabric to abrasion, the Fiber-Bond process adds materially to its tensile strength and—without causing it to be water-repellent—makes it more resistant to the action of water and acids. The finish itself exhibits considerable resistance to washing, does not modify the normal shrinkage of the goods, is unaffected by Sanforizing, and, it is stated, does not impede mechanical cutting of the material nor heat sewing machine needles.

Results of comparative tests made by Copeman Process Co. on cotton fabrics finished in the usual way and by the Fiber-Bond method are given in the following table:

Fabric	Increase in resistance to abrasion of Fiber-Bond finish over regular finish	Increase in tensile strength of Fiber-Bond finish over regular finish	
		Warp	Filling
6. 15 yd. Cambric (64 x 60)	21%	17%	32%
2. 85 yd. Jean (96 x 64)	47%	15%	5%
2. 35 yd. Twill (unbleached)	63%	25%	87%

The abrasion tests mentioned above were carried out on a special abrasion testing machine developed by Dr. Bartell. This device has a number of interesting features not found in other types of testing machines. With it, strips of fabric, held at a constant tension, are subjected to rubbing by an abrasive stone wheel. At each revolution the wheel is cleansed with sand to remove all fuzz, starch, or gum. The sand also has a tendency to work into the material and cause internal friction as well as surface friction. A counter registers the number of strokes of the abrasive wheel against the cloth, and the wheel stops automatically when one of the strips of cloth being tested is worn through. The abrasive stone, the mesh of sand, and the tension at which the material is held can all be reduced to constant standards.

Machine abrasive tests are being carefully checked with actual wear tests in the shoe trade. The wear tests are made by making two pairs of identical shoes with the same quality of lining, but with the lining in one pair Fiber-Bonded and the lining in the other pair finished in the regular way. The wearer divides up the two pairs so that the left shoe of one pair is regular finish and the right shoe Fiber-Bond, wears them until the lining in one shoe is worn through, and then wears the other pair. This gives a balanced test of both regular finish lining and Fiber-Bond lining for right and left shoe. These actual wear tests appear to be in ratio with the laboratory abrasive tests.

One of the advantages of the Fiber-Bond process is that lighter-weight and lower-count goods can be stepped up in durability to equal, and sometimes even exceed, heavier goods. This permits the use of less expensive fabrics with no loss in wearing qualities. Thus, one comparative test of a 2.00 twill with regular finish and a 2.35 twill with Fiber-Bond finish shows that the lighter material with the Fiber-Bond finish has a 70% greater resistance to abrasion than the heavier material with the regular finish. Since the cost of Fiber-Bonding can usually be figured at less than the difference in the price of the two fabrics in the gray, plus the cost of the regular finish on the heavier material, the consumer benefits doubly, obtaining a more durable finished fabric at a lower total cost for gray goods and finishing.

THE UNITED STATES cannot afford to dominate the world market for raw cotton. . . . This is the startling conclusion reached in an article entitled "Cotton's In the Well" in the July issue of* Fortune. *An abstract of this article appears below.

COTTON . . .

U. S. domination of world market seen at end

PRIOR to 1932 the United States produced upward of 60% of the world's cotton crop; the United States now produces little more than 40%. World consumption of American cotton has decreased by more than 20% from pre-depression levels, while world consumption of foreign cotton has increased by 45%. Six months' consumption of American cotton is now 5,750,000 bales; of foreign cotton 7,000,000 bales. Total exports of U. S. cotton in the eight months ended April 1, 1935, were 3,565,000 bales, as against 6,098,000 bales in the corresponding months of the year before.

Briefly, what these statistics seem to signify is that American cotton has gone or is going precipitately and irretrievably to hell. The plain citizen will wish to know

First: whether there *are* other cotton-growing countries capable of growing enough cotton to supplant us in the world market. If there are he will wish to know

Second: whether we can do anything about protecting our foreign markets and particularly whether the quashing of the AAA and the restoration of the old cotton acreage will have that effect. If the answer is also in the affirmative he will wish to know

Third: whether there is any independent reason, social or economic, why we should not take steps to hold, or to regain, our world position.

The facts bearing upon these three questions, as collected in this article, seem to indicate that the real reason why American cotton is on its way to hell is neither AAA crop restriction nor American tariffs, but something quite foreign to either: the migration of the cotton textile industry from western Europe to the Orient.

Answering the questions raised above, in order:

1. *Other cotton-producing countries are physically capable of supplying the world cotton requirements until recently supplied by the U. S.*

The first fact to be grasped in support of this statement is the fact that the U. S. enjoys no physical advantage of soil, climate, and the like, which effectively excludes foreign competition. There is no reason whatever for believing, as the old southern Senators used to believe, that U. S. cotton is king and that God has anointed it forever.

Other than the U. S., there are only five important cotton-producing countries in the world: India, China, Russia, Egypt and Brazil. Whereas three of these five, India, China and Russia, need cause the American cotton producer no concern, two of them, Egypt, and particularly Brazil, are potential rivals.

2. *Increases in foreign cotton production can be discouraged by the removal of restrictions on American acreage, the dismantling of the loom program, and the sale of increased American crops at world price level.*

The reason is merely that world cotton acreage responds to changes in world cotton prices and that world cotton prices have generally followed American cotton prices. It does not, however, follow that the United States would recapture its entire cotton empire even for the period during which it was willing to sell cotton at world prices. For the cotton empire is attacked not only from within by other producers, but from without by common enemies. Cotton experts contend that 20% of the domestic cotton business has already been lost to competitors of cotton. The chief of them—rayon—not only competes successfully in the eye but in the pocketbook.

3. *The U. S. cannot afford to dominate the world market for raw cotton.*

The first reason is that, to sell the same proportion of world requirements as we sold before, we should be obliged to sell at a price which would not support the tax and mortgage structure now resting upon cotton in the South.

Enter Japan

The second and more important reason is the Japanese threat. To dominate the world cotton market, the U. S. must sell its cotton to the largest buyer on that market, which is Japan. And to sell its cotton to the largest buyer on that market, the U. S. must be prepared to accept that buyer's goods in exchange.

Now the U. S. cannot permit unlimited importation of Japanese goods other than certain raw materials, such as silk—and silk will shortly cease to be a factor in world commerce.

Tariffs cannot make up the difference between Japanese wages of $2.00 to $5.00 for a 56-hr. week and American wages of $18.00 to $30.00 for a 30 to 40-hr. week. And the results will be the same whether trade with Japan is direct or round-about through some other country, such as the Philippines, for the cheap product threatens the high wage scale at two removes as well as at one. Only the interval of time will differ.

With that fact we come to the heart of the American cotton crisis. With that fact we discover that the key to the crisis is not a mere local and parochial disturbance caused by the interference of an American political party in a matter beyond its comprehension, but one of the major economic dislocations of our time. The key to the cotton crisis is the migration of the industrial revolution toward the cheap labor pools of the Orient.

The probability is that America, which now practices economic nationalism in cotton, while talking tariff reform, will accept and make permanent the existing situation. In which case Secretary Wallace, champion of international trade relations, will be remembered as the founder of a closed economy.

THE RECENT sharp about-face in the raw wool situation might have been anticipated, since increased consumption this year was almost certain to follow as a reaction to the abnormally low consumption of 1934. Here is an article that traces the movement.

WOOL

By William H. Butler

Likely to hold the higher price levels reached after May's record activity

DOMESTIC wools at the beginning of July were in a better all-around position than for a long time. The several changes made in marketing methods and the heavy mill consumption of the first six months, leading finally to the sharp rise in values under active buying in May, foreshadow a stable market for the remainder of the year with the probability that prices will be higher rather than lower. All vital factors bearing on the raw material are now evaluated favorably. Although there is nothing in sight to suggest any reversal of the wool position, the outlook is colored by possible developments in manufacturing circles as well as by new proposals emanating from the AAA. The foreign markets all have a cheerful tone, are well above domestic parity, and may be left out of immediate consideration.

Heavy buying in Boston and other wool centers by manufacturers prior to the Supreme Court NRA decision reduced the total available supply of wool in the United States as of June 1 to a point 6% under the preceding four-year average on that date. Holdings of approved houses on June 1 were smaller than in any of the preceding three years. In addition to this reduction in dealers' stocks, it is probable that wool manufacturers have been larger buyers of new clip wool on direct account than is generally believed. While their heavy consumption for year to date has obviously been well in excess of their purchases from accredited houses and other dealers, the total acquirement of raw material by some of the larger mill organizations has probably covered their machine requirements well ahead. The increase in direct purchases by mills and topmakers is a development that is being watched with interest.

In the early part of this year the declining trend in the colonial markets and in London, in conjunction with the largest unsold surplus of domestic wool for years, exerted a very depressing influence. Although the colonial markets began to point upward in February, it was not until May that the domestic situation turned.

The concerted agreement reached in February by wool houses in the Government setup, in conjunction with the wool and mohair advisory committee, remedied a long standing and disorderly price situation and placed domestic wool on a basis to protect the American grower from the then impending encroachment of lower-priced foreign combing and carding wool. Prices were revised downward 10%. What the conference actually achieved was not so much a revision of prices as a recognition and adoption of prevailing rates as valid for the sale of Government wool. The official recognition of those market rates as agreeable to men in charge of the merchandising of Government-mortgaged wools, dispelled considerable uncertainty and removed some of the obstacles to trade.

In late March the wool marketing plan for the 1935 clip was modified with view to bringing about fuller and more flexible cooperation between growers, dealers and consumers. Cooperation was substituted for control. Domestic wool was to be sold on a marketable basis, representing a collective view of the supply and demand situation rather than any individual appraisal. A reporting of daily sales and a weekly meeting of the accredited group with the advisory committee was essential to the plan adopted. The marketing of wool thus became more flexible and approved houses were placed in a comparatively free position. Consequently, it was expected that wool prices, under minimum restraint, might be expected again to fluctuate with changes in supply and demand.

May was a month of unusual and record activity. More wool was sold then than in any other peace-time month. After four months of declining prices this new buying pressure made prices rise sharply, the peak being reached at the close of the month. At that time the Supreme Court decision annulling the NRA affected the entire industrial structure. In the case of wool, there was immediate subsidence of buying in both East and West.

In accounting for the sharp rise in wool in May, full weight has to be given to the unprofitable levels on which wool had been selling, and to the mistaken belief of many manufacturers that wools were to move even lower. For weeks the mills had been able to buy large quantities of original bag territory and fleece wools at very low prices and the market was without resiliency. During this period foreign wools were on the upgrade but this basic betterment in the general situation was apparently unnoticed. The stocks of unsold 1933-34 wool, which in the early part of the year seemed an almost insuperable obstacle to a better market for the raw material, became less of a serious factor. The start of 1935 with an excessive surplus, resulting from a slump in wool consumption in 1934 to 65% of the previous five-year average consumption, had led statisticians to predict that the 1935 consumption would at least return to the five-year average. This prediction is in a fair way to being realized.

Man in the Mill

Vital factor in code conformance S.T.A. members are told

THE man in the mill is being called upon to help in the emergency created by the abrupt termination of NRA codes, just as he is drafted in every emergency. Operating executives, superintendents, overseers, etc., received this call at the annual meeting of the Southern Textile Association at Myrtle Beach, S. C., June 14 and 15.

"Don't try to take any short cuts in wages or hours," was the warning sounded by Thomas H. Webb, president of the American Cotton Manufacturers Association. Similarly, W. M. McLaurine, secretary of the A.C.M.A., read a series of letters which had gone out to his members, urging code conformance. There are a hundred reasons for conformance and not one reason for nonconformance, he declared.

In fact, the president of the S.T.A., Culver Batson, of Lynchburg, Va., dwelt with great emphasis upon the responsibility which rests on operating executives today. Even Prof. Gaston Gage, of Clemson Textile School, in his technical paper on textile research, touched incidentally on the problems incident to code termination.

There seemed to be a deep realization among those who attended that code-making days entailing expeditions to Washington on the part of chief executives, had been succeeded by a new situation in which the major problem rests with each mill, and in which superintendents and overseers, in their daily contacts with operatives, play a most important part.

The Friday morning session opened with a word of welcome from John A. McFalls, of Rockingham, N. C., vice-president of the association.

The first address was by President Culver Batson, who opened his remarks with a warning that the Southern Textile Association is entering its 28th year of activities "at a time when the textile industry is passing through one of the most critical periods in its existence." Citing passages from books and periodicals published in the 1850's, he endeavored to show that the textile mills had their troubles and "critical periods" then as now, and that the present difficult situation is nothing new to the industry.

Mr. Batson next traced the growth of the cotton textile industry from Samuel Slater's mill, started about 1790, to the 30,000,000 cotton spindles in place in the United States last March. After describing the remarkable growth of the industry in this country, he pointed out the dangers of foreign competition and urged the members to help America by producing the best goods at the lowest cost. This must be done, he explained, without lowering the living standards of the American operative.

Declaring that the industry has been criticized as being backward in technological progress, and that it "has not utilized research as have the great chemical and electrical trades," he urged a closer understanding between operating executives and technical graduates, and suggested that some provision be made by the association to admit such young men as junior members. A second suggestion along this line was that the association take definite steps to foster and improve night schools for men who are already in the industry, and who cannot take advantage of the technical schools. Mr. Batson concluded his address with an admonition that "the plant or man who remains backward is lost . . . we must continue to ask 'why' and make use of the answers . . . there can be no halt to progress."

The next speaker, Mr. Webb, declared that "we are at the present time passing through the most unsatisfactory period in our careers." Warning that no chain is stronger than its weakest link, he compared the management, supervisory staff and operating personnel to links in the cotton textile manufacturing chain. "No matter how strong financially the owning corporation or firm may be," he said, "or how up-to-date the equipment of the plant is in every detail; no matter how skilled the operatives and how contented they are with working conditions, village surroundings and rate of pay . . . if there is an inefficient, grouchy superintendent or overseer who does not sympathize with his help, you have a weak link in your chain that spoils its efficiency. Let no member of this association be guilty of constituting that weak link!"

JOHN A. McFALLS, general superintendent, Entwistle Mills, Nos. 2 and 3, Rockingham, N. C., elected president of S.T.A. at Myrtle Beach convention.

Mr. Webb then read certain resolutions, recently

adopted by the two major manufacturers' associations, recommending that "no changes be made in the conduct of the cotton textile business" as a result of Supreme Court decision on NRA. In conclusion, he urged the members to aid the executives in carrying out the agreement provided for in these resolutions, and to do nothing which might bring "reproach on the industry that is providing a living for you and your families."

Featuring the Saturday morning session was an address by Prof. Gaston Gage, Clemson Textile School, Clemson College, S. C., on "Some Angles of Textile Research."

Discussing maximum breaking strength of yarns, he said, "It has been thoroughly established that the maximum breaking strength of yarn, broken in a skein, can be obtained with a twist multiplier of approximately 4.30, varying slightly with the cotton used. Breaking the yarn in single strand, the maximum breaking strength is obtained with a twist multiplier of approximately 5.25. Now, which one of the above two twist multipliers will give a maximum breaking strength in the cloth? I cannot find where the test has ever been carried on into the cloth."

CULVER BATSON, superintendent and division manager, Consolidated Textile Corp., Lynchburg, Va., who served last year as president of the S.T.A.

Next, he took up the subject of shifting drafts on roving frames:

"I was told by Mr. Coulson, of the Shirley Institute of England," he said, "that his experiments had shown that it was possible to reverse the order of draft on the roving frames and not hurt the spinning qualities or breaking strength of the yarn. The usual order is approximately a draft of 4.5 on the slubber, 5.5 on the intermediate and 6.5 on the speeder. This can be changed to 6.5 on the slubber and 4.5 on the speeder with no appreciable effect on the yarn spun from the product. It might be possible to balance the machinery layout by shifting the different drafts on the roving frames."

With reference to testing first-drawing sliver for irregularities, he explained that at Clemson "two boys ran some tests on the irregularity of first drawing sliver, compared to the card sliver it was run from, using three different roll settings. They used what was called a close setting, or $\frac{3}{16}$, $\frac{3}{8}$ and $\frac{1}{2}$ in. over the staple length; a normal setting, or $\frac{1}{4}$, $\frac{7}{16}$ and $\frac{5}{8}$ in. over staple length, and a wide setting, or $\frac{5}{16}$, $\frac{1}{2}$ and $\frac{3}{4}$ in. over staple length. They found that the wide settings showed the most improvement over the card sliver, as to irregularity, but the difference in improvement between the wide and normal setting was hardly significant.

"Another pair of boys ran a similar test on irregularity due to tight, normal and loose tension on the drawing frame. They used a range of five tension gears and found a distinct difference in the regularity. It so happened that their middle gear gave the best results and the irregularity increased with each gear used in both directions.

"Still another pair of boys ran tests on irregularity of slubber roving with different roll settings. The settings used were close, or $\frac{5}{32}$ and $\frac{5}{16}$ in. over staple; normal, or $\frac{7}{32}$ and $\frac{3}{8}$ in. over staple, and wide, or $\frac{9}{32}$ and $\frac{1}{2}$ in. over staple. The wide setting showed the least irregularity in roving.

"All of these problems were based on $\frac{1}{2}$ in. lengths that were weighed for irregularity. This information cannot be accepted as final. Check tests should be run to corroborate them. What effect this difference in irregularity would have on the spinning and breaking strength could not be determined this year. We may get into that later."

Professor Gage concluded his address by urging each mill man to "have your house in order" by laying more stress on research.

John A. McFalls, general manager of Plants Nos. 2 and 3, Entwistle Mfg. Co., Rockingham, N. C., who has served the association as vice-president for the last year, was elected president. Fred L. Still, Greer, S. C., was elected vice-president, and Edwin M. Holt, Cooleemee, N. C., was named chairman of the board of governors. D. H. Hill, Charlotte, N. C., was re-elected secretary.

New members of the board of governors were elected as follows: Joseph C. Cobb, Langley, S. C.; Webb Durham, Hogansville, Ga.; M. T. Poovey, Rockingham, N. C.; L. J. Rushworth, Danville, Va.; and W. H. Hardeman, LaFayette, Ga.

Those present at the Friday evening banquet were entertained by a riotous skit written by Harvey Hill and executed by Junius Smith and Douglas Newman. Fred Still presented the retiring president, Culver Batson, with a medal of appreciation from the members. The remainder of the evening was devoted to awarding golf prizes, etc.

Thursday evening, preceding the convention proper, the associate members division of the S.T.A. held its fourth annual meeting. W. B. Uhler, Borne Scrymser Co., Spartanburg, S. C., was elected chairman for the ensuing year to succeed I. E. Wynne, Universal Winding Co., Charlotte, N. C. The dinner was featured with a short talk by Culver Batson and a floor show.

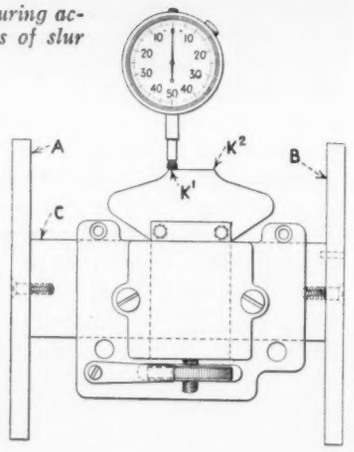
The Arkwrights also held a short meeting during the convention, at which time the following officers were elected: T. W. Mullen, Roanoke Rapids, N. C., president; J. O. Corn, Columbia, S. C., vice-president; Culver Batson, chairman research committee; Robert W. Philip, Atlanta, Ga., and Marshall Dilling, Gastonia, N. C., new members research committee.

Washboard

And its elimination in three-carrier hosiery knitting

By Walter A. Simond

Means for insuring accurate settings of slur cocks.



In the accompanying diagrammatic sketch, the sides of the fixture, A and B, and the top plate, C, are made from three pieces of cold-rolled steel, 3/8 in. thick, 2 in. wide, and 6 in. long. This construction affords a weight which is an advantage when the fixture is used on a surface plate. The top plate, C, should be reduced to the width of the slur bar in the machine, and the top face and the working edge should preferably be ground straight. The top should be inclined slightly until the working edge or face of the slur cock is perpendicular when the slur-cock box is mounted for the test as shown, because gravity will keep the slur-cock box against the working edge of the fixture. The fixture should be placed on a surface plate or work bench where it will not rock, and the slur cock box mounted as shown. With this set-up a good micrometer indicator is mounted on a surface gage and the indicator moved up to the knitting surface, K1, until it reads a perfect zero. Now the slur cock box only is moved to the left as far as the K2 position and the movement of the indicator noted. The working face of the slur cock is usually slightly concave, and it must never be convex. If the knitting face K1 to K2 is worn, the slur cock should be replaced with a new one, because it is usually surface hardened and not deep enough to permit refinishing. If the slur cock needs readjusting, the clamping screws may be loosened slightly and the slur cock tapped into position with a soft metal hammer until the indicator reads an absolute zero at both K1 and K2 after the slur cock is firmly clamped.

EVERY manufacturer of ringless has discovered that the advent of this better product has been accompanied by a number of new problems, without any elimination of the old problems which have always attended the fabrication of fine hosiery.

An answer to a question which TEXTILE WORLD published in its March, 1935, issue and an article which it published in April, 1934, were well written and very thoroughly covered the subject of three-carrier hosiery; but they differed in their conclusions as to the main cause of the washboard effect. It is not the purpose of this writer to say what the chief cause is—it varies—but rather to indicate briefly the preventive measures to be taken to overcome the bulk of this defect. Although "there will still be a monumental amount of washboard effect in three-carrier fabric" after we have done our best, the monument need not stand on an empty lot.

Following are ten precautions to be undertaken to avoid washboard. The first eight apply primarily to three-carrier hosiery. The last two apply to any hosiery.

1. *Silk diameters.* It is obvious that the silk should be uniform in size, though we cannot do better than buy the best silk we can afford. It will help us to know, however, what the peculiar effect of varying silk diameters is in the case of three-carrier knitting. The carriers move in 1, 3, and 2 order, first from one side of the fabric and then from the other. Whether the silk is running with one fine and two larger threads or with two fine and one larger, it causes a three-course marking which distinguishes it from the old washboard defect which results when the slur cock knits or draws a shorter stitch for every other course.

2. *Carriers.* Each of the three carriers, with their tubes, must be perfectly smooth and clean.

3. *Snappers.* When the snappers are in proper condition, they have practically no effect on the fabric, because they are wide open while the silk is running. They should be examined occasionally where the silk contacts the cast iron. With a pocket microscope one can quickly determine if there is any corrosion on the finished surface of the iron.

4. *Falling rings.* These should be of uniform weight and replaced as soon as they show a groove.

5. *Tensions.* Wicks and felts cause a great amount of uneven tension. There is a field for a rustless device which may be quickly adjusted to give the desired amount of tension. It is fortunate indeed that the wet silk slips so smoothly over the felts and wipers now in use. The passage of knots, however, often causes a tight place, usually for a partial course. The glass tubes under which the silk passes in water cause very little trouble, but they should be washed frequently to remove the gum which collects on them. A direct-running silk theoretically should overcome some of the trouble we commonly experience from uneven tension.

6. *Cones.* The wind of the cones should be sufficiently open to prevent chafing of the unwinding thread against the adjacent thread on the cone surface as the former races up and down. The cones ought to be wound at a medium tension and to a medium size to avoid surface tension in delivery. Tests on winding should be conducted with a "Tensometer" by some research council and the results published for the benefit of all manufacturers. It is probable that variations in tension caused by the cone would be found to be less than is generally supposed.

7. *Conditioning.* This is a very important factor, and the three cones on each head need to have been conditioned alike. Above all else, any process which degums or causes the gum to strip in knitting should be avoided, for this changes the diameters of the silk threads.

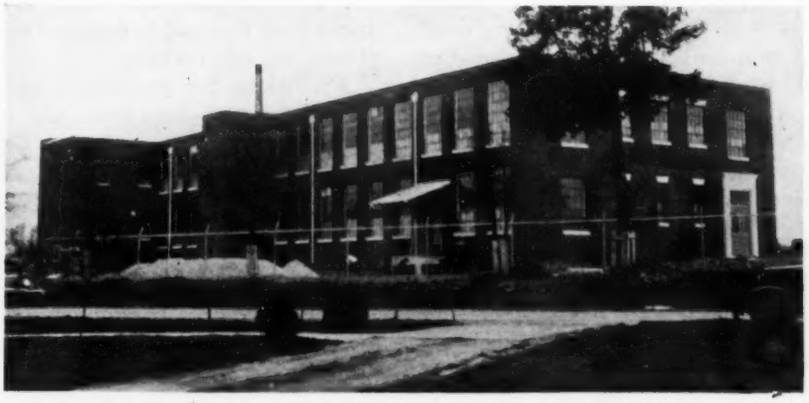
8. *Cleanliness.* Metal parts that contact the silk should be cleaned regularly with gasolene or other solvent to cut the gum, then wiped dry and lubricated with the best of stainless oil to prevent corrosion.

Since all of the faults mentioned in the preceding eight paragraphs affect the silk threads in each of the three carriers, the resulting fabric will show the new washboard triplet formation. Now let us consider the two things which have most frequently been blamed for washboard in the past.

9. *Verge plates and jack beds.* These are thought by some to have a bearing on washboard knitting. Improperly set, they cause the stockings to be longer on one side or allow the drawing of uneven lengths of stitches in succeeding courses. We may find either of these results and sometimes both in the same stocking. Since the verge plates and jack beds are stationary, it is highly improbable that they can be so placed as to create variations in alternate courses for the washboard effect.

10. *Slur cocks.* When these become worn on the outer face of the full-depth corners or when they are slightly misplaced or displaced, they cause the old washboard defect which is always distinguishable by its alternate short- and long-stitch courses, as against the triplet formation of the three-carrier defect. It is very important that this old doublet formation be entirely eliminated, else, with the three-carrier, we have a complex formation which is exceedingly undesirable. As a result of many years' experience, the method illustrated and described above is offered as a sure and simple procedure for obtaining an accurate slur-cock setting. The size of the silk we cannot control, but we can remove causes of uneven tension to a large degree and we can entirely eliminate the old doublet washboard.

In the Modern Manner...



Front view of mill before landscape gardening was completed

New Grabur plant exemplifies latest trends in silk throwing

By C. W. Bendigo

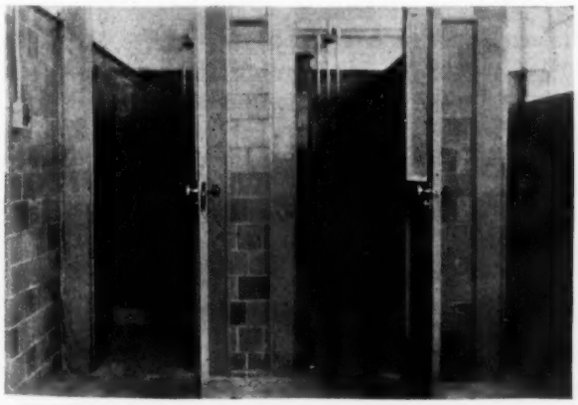
EMPHASIZING quality production through use of modern machinery and methods, the May & McEwen hosiery interests, of Burlington, N. C., recently started operation of a new tram throwing plant near Burlington. Originally called Joseph R. Morton & Co., the name has been changed to Grabur Silk Mills, Inc. The plant has a potential capacity of over 10,000 lb. of silk weekly, but at present is producing only a part of this. The poundage, however, is constantly increasing as more machines of the present installation are started.

The building is practically fireproof, being constructed of brick, steel, and glass. It was planned specifically to house the throwing plant in the following manner: bottom floor or basement—vault, opening department, soaking and drying rooms; top floor—winding department; ground floor—spinning and coning departments, shipping room, and offices.

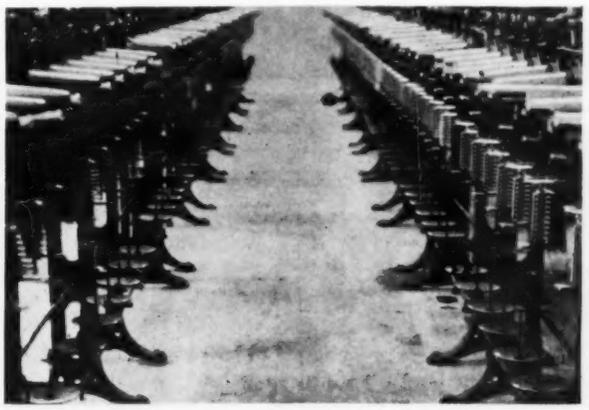
Scientific planning of the soaking room resulted in all the tubs being placed equi-distant from one of the extractors. These tubs are sunk into the floor for greater convenience and are equipped with flood-exhaust valves. A circulating mechanism is employed to insure maximum uniformity of soaking-liquor take-up. Extractors have automatic timing devices.

In keeping with the ideal of a modern plant for highest quality production, all machinery is new. Included are Sipp-Eastwood skein winding machines with new piston-type traverse driven by an improved rounded cam which uses a round roller against its face to develop a smoother motion. These machines are of the single-deck, oilless type with individual variable-speed drives and are equipped with Collins interchangeable-blade cleaners. Fletcher Duplex machines installed have oil-retaining bushings throughout, new type of self-oiling vertical rings, and Oilwell spindles and idlers; feed rolls have a groove around them for better separation of the thread laps; a new knock-off motion throws the spindle farther away from the belt than formerly, so that bobbins can be doffed without encountering the centering guide above.

Fletcher Apex twisters No. 35 comprise the twister installation; features of these machines are unit control, top deck narrower than bottom, heart-shaped traverse cams, Oilwell spindles, adjustable spindle springs, and oil-retaining bushings throughout. For twist setting, the



Women's shower room—Individual booths and private dressing rooms are provided. Walls of plant are tiled as shown here.



Looking down a lane of coners—These are in separate room with higher humidity than rest of mill. Each spindle has pineapple attachment and clutchless drive.

latest Lydon electric steam box is used. It has precise control over temperature and degree of moisture during the operation. A chart gives a record of each steaming.

Universal cone-winding machines installed are equipped with a new clutchless drive to permit a smooth, slow start-up. Each spindle is equipped with the recently developed pineapple cone attachment. To facilitate direct knitting, coning is done in a special room in which humidity is maintained at a higher point than elsewhere in the plant.

The entire installation is so arranged that one size and type of bobbin board can be used efficiently in every department from winding to coning. To insure clean yarn, oilless bearings and bushings are used where possible, and every thread is cleaned three times while being thrown to rid it of slubs, bad knots, lint, etc.

Stroboscopes are utilized constantly to guard against twist variations. A Suter twist and take-up tester also is used for maintaining high accuracy, as are densimeters and tensiometers. Constant temperature and humidity are maintained throughout the year by means of a dual air-conditioning system which can be used either for heating or cooling. In dry, dusty weather the air admitted can be washed.

A feature which adds much to the plant's interior appearance is the wall, which is tiled to a height of 6 ft. Floors of the halls, waiting room, shower rooms, and toilets are of Terrazo.

Provisions for employees include a shower room for men, a spacious rest room and individual shower booths for the women, and a sanitary lunch room. Refrigerated drinking water is available at convenient points.

E. I. Bendigo, formerly throwster for Mock, Judson, Voehringer, Inc., Greensboro, N. C., was in charge of the plant's installation and is now its superintendent. Officials of the company are J. H. McEwen, president; W. H. May, vice-president; B. V. May, treasurer; and P. K. Holt, secretary.

Reeds and Reeding . . .

Some pointers for the novice in dissecting silks and rayons

IT is sometimes difficult for an experienced man to put himself in the position of a novice in the business and to realize how puzzling some of the commonest practices can be to the beginner. It is desirable occasionally to attempt to do this, however, as the trick gives us a better understanding of the problems which confront the novice and aids us in instructing him. Occasionally, also, it leads us to question whether or not a certain thing is being done in a certain way because it is the best way or simply because it is the common, general, every-day way.

The following inquiry, recently received by our Questions and Answers Department, is interesting as typical of the requests for information made by novices; and to many of those just becoming engaged in the dissecting of silks and rayons, we hope the answer will be helpful:

> "Will you please detail to me the method of determining the reed and dent of a woven fabric. For example, given a fabric whose construction is 55/3/2, how are the 55 reed and 3 dent determined? Is it possible to get a good approximation of the construction of a cloth after it is finished? What is meant by '80 pick wheel'?" (8235).

We replied to the above inquiry as follows:

If you adopt the following method, you will, with little practice, be able to determine the reed and ends per dent, although it is necessary to assume you are somewhat familiar with fabric constructions.

To find the ends per dent, it is primarily essential to know how many ends are used in a repeat of the harness. We assume that you are referring to a taffeta weave, as the construction you specify is of the French-crepe line.

It is most practical to employ a ¼-in. counting glass. Place this on the fabric and count the warp threads that show at the top of the sample. In a taffeta the number must be doubled, because half of the warp threads are on the bottom or face side of the fabric. If it is, by any chance, a three-harness twill, the number must be tripled; and if it is four or more harness, it must be multiplied by the number of harness in the repeat.

Assume we have a fabric of taffeta weave which shows under the glass 23 warp threads to the ¼ in. Thus, $23 \times 2 = 46$, $\times 4 = 184$ ends per inch.

Now, then, the problem is to find what reed we are to use and how many ends per dent. According to the above figure, we can use either a 92 reed, 2 ends per dent; a 61⅓ reed, 3 ends per dent; or a 46 reed, 4 ends per dent. Although this is the problem that stumps most novices, the practical man can tell at a glance which reed is the most practical to use. The best method we have found is to hold the fabric against a strong light and note whether the ends are grouped in twos, threes, fours, etc., such divisions being caused by the dent wires. Counting these groups or dent marks in the ¼-in. glass will also indicate the number of dents per inch.

In looking through the glass on the fabric you mentioned against a strong light, you will find the ends are grouped in threes and the dent marks count 15×4, or 60. However, we have to figure the contraction and shrinkage, which vary. Some fabrics are shrunk from 5 to 10% and over, but figuring a shrinkage of 10% in the fabric in question brings the count of the reed to 55. Therefore, the reed and reeding are 55/3/2.

With respect to the second part of your question, it is possible to get a good approximation of the cloth construction from the finished fabric; but, as we said before, the party dissecting must be familiar with weaves and have a good knowledge of dissecting.

As to the "80 pick wheel," this term means that the cloth is supposed to have 80 picks per inch. It is confusing terminology, however, due to the creepage which is bound to occur. If you use an 80 pick wheel, you actually make a cloth that will count 82 or 83 picks to the inch. Of course this situation can be rectified by slight changes at the loom.

Spots on Hosiery . . .

By Harry White

Simple test avoids those due to use of dyes sensitive to sulphur dioxide

IN dyeing silk hosiery, we find occasionally that it is necessary to keep a lot of dyed goods in the dyehouse overnight. This has happened, for example, when dyeing of a rush lot was started late in the afternoon, and we did not have sufficient time to complete matching of the goods to the desired shade before dark. We had done this several times without any trouble, until one morning we found to our surprise that a good part of a lot showed irregular red spots or blotches.

We were at a loss as to the cause of the spots, but thought that possibly some dissolved dye in being poured into a dyeing machine had been spilled accidentally on the goods, or that the trouble might be due to formation of mildew on the damp silk. Taking one of the damaged stockings, we boiled it for 20 min. in water without any additional dye and then added the original percentage of salt. Fortunately, our first attempt was successful, the blotches disappearing. Similarly, the whole lot was remedied. A day or two later the same type of spots appeared on goods which had been left unboarded overnight in the boarding room. An examination showed that only those goods in the top bags were streaked. We were unable, however, to find the cause of the trouble.

A few days later, in talking to a salesman for a dye manufacturer, we mentioned this occurrence and asked him whether he could give any reason for the spots. He replied that several mills had complained to his company about a similar trouble which had been reported by women who had purchased the hosiery at retail. The customers stated that after the stockings had been washed and then hung up to dry, red spots appeared all over them. An investigation had shown that these mills were all using Nerol 2B (C.I. 304) and that dyeings made with this color, when exposed in a damp state to sulphur dioxide fumes, developed red spots. Upon learning this, we were quite sure that the dye itself was at fault, as we had just started to use this particular product a short time before we ran into the difficulty. To make certain, however, we dyed a sample with the straight dye and hung the damp swatch in an open window. After about 45 min., the red splotches began to appear. Naturally, we immediately discontinued the use of this dye.

Going further into the subject, we found that a somewhat similar trouble had been investigated by a research worker of the National Association of Hosiery Manufacturers, located at the U. S. Bureau of Standards. In this case green discolorations developed in hosiery which had been dyed with Sulphon Cyanine Black B (C.I. 307). In a report on this problem the following statement appears:

"We have found that one of the most common causes of this type of trouble is due to the action of sulphur dioxide fumes on the damp hosiery when it is hung to dry after washing. The extent of the color change was found not to be so much dependent upon the actual quantity of sulphur dioxide as on the relative amounts of alkali present in the stocking and sulphur dioxide in the air. The trouble appears most likely to occur in material which is only slightly alkaline in slightly contaminated atmospheres and may not appear at all unless the proportions are correct. Sulphur dioxide in the air may come from adjacent chimneys, gas burners, furnaces, etc."

In the February issue of TEXTILE WORLD, the writer outlined the procedure which he uses to test the suitability of hosiery dyes for specific purposes. One of the tests mentioned, but not described in any detail, was one to determine whether or not the dyeing is sensitive to sulphur dioxide. The necessity for such a test has been indicated in the preceding paragraphs.

The test itself is carried out by wetting a dyed swatch in a very dilute solution of soda ash or other alkali, hanging it while still damp in a bell jar in which a small piece of sulphur is set burning, allowing it to hang for twelve hours, rinsing with cold water, wringing, and drying. Development of red or green spots or any other discoloration of the sample indicates that the dye is sensitive to sulphur dioxide fumes and may cause trouble if used for dyeing silk hosiery.

It is rather interesting to note that at the time we discontinued the use of Nerol 2B, we checked all of the other dyes which we had in stock, but did not find any which were sensitive to sulphur dioxide. All in all, we got out of that trouble pretty cheaply, and to make certain that we do not run into the same difficulty again, we never fail to include the sulphur dioxide test in our examination of any new dyes which are offered to us.

When to Stop Testing

Graphic method of recording results shows point at which sound conclusions can be drawn

By A. E. Oxley, D.Sc.

TEXTILE men are well aware of the necessity for constant testing of raw materials, goods in process, and finished products. They realize also that adequate sampling is important if the tests are to mean anything. However, very few people know just how many tests are necessary before a sound conclusion can be drawn as to the strength, size, twist, or other property of the fiber, yarn, or fabric under investigation. In this discussion, therefore, we shall place particular emphasis on the art of knowing when to stop testing.

Testing of textiles may be classified in three groups: (1) routine testing for purposes of quality control of products, (2) routine testing for the economic control of mill processes, and (3) specialized testing carried out in connection with research on products or processes. Whatever the nature of the property tested, the data resulting may be analyzed from two angles: (1) graphically; and (2) numerically. In the graphical method, we classify the data so that all the values lying within small equal ranges are grouped together, and then plot a graph with the abscissa representing these grouped values, and the ordinate representing the total number of test specimens falling within each group. The result is called a "frequency-distribution polygon" of the property measured, and this polygon will be smoother and represent more definitely the quality and variability of the material the larger the number of tests made. Such a frequency polygon is shown at *XYZ* in Fig. 1. With a relatively few tests, it will be irregular, as shown by the dotted lines; as the number of tests increases, it will become smoother and more continuous, as shown by the full line. The limits *X* and *Y* show the extreme variation of the property measured and also the number of specimens tested which have such values. *Z*, the highest point on the curve, is the most frequent value found and is called the "mode," Line *P*. If we add up all the test values and divide by their number, we find the arithmetic-mean value, Line *M*. Usually it will be found that the mean and mode do not coincide, and the frequency graph is then called "Skew." When they do coincide, the graph is symmetrical about the mean or mode, the skewness is zero and the distribution of the test values is called a normal probability one. When comparing two products, *A* and *B*, the graphs are plotted together, *XYZ* for *A*; X^1 Y^1 Z^1 for *B*. We can at once see which product has the stronger average value, and which is the more irregular and the more skew. The latter has an important significance—it implies the existence, in processing, of some abnormal factor which is giving rise either to an undue number of high or low test values.

Graphs designed for such comparisons must be prepared from equal numbers of tests. The more tests within the area of each graph, the more accurately does the graph define the standard product *A* against other products produced either by modified processing, which the mill management may desire to adopt, or by other processes used by competitors.

Adequate Sampling

The problem of adequate sampling is one of paramount importance. If only a few tests, say 10 or 12, are made, as is common, we have no guarantee that they represent in due proportion all values within the product; therefore no sound deductions can be drawn from them. We can only form a rough judgment that the product is approaching a standard if the distribution of these test values conforms approximately with the smooth standard graph. If not, more tests must be made until we are satisfied whether or not this is definitely so. In mill routine work, this is not generally practicable, and in such cases the limited data have little value beyond a warning of the dangers which are being run by accepting deductions therefrom. The test values may be accidentally high and cause undue optimism, or they may be low and cause unnecessary pessimism.

If the tests are properly controlled, all the test data, for any property of a definite product, may be pooled and accurate standards deduced from years of accumulated tests. Such standards are of unique value when important changes in processing, reorganization, or introduction of new machinery are contemplated.

The test results should be piled on one another in groups, say of 100, 200, 300, etc. (Fig. 2), and the shapes of the resulting frequency graphs studied. It will usually be found that the shape determined by the accumulated data changes, and as long as this is the case we must continue testing, for a change of shape implies that the product has not been adequately sampled. When the graph has become steady by further additions of tests, the testing is complete, and we may compare the graph with the standard graph after reducing its ordinates in the ratio of the total number of the new tests to the total number of tests included in the standard graph. This reduction is necessary in order to make the two graphs strictly comparable by shapes.

Numerical Method

The simplest operation in a numerical comparison is to add all the test values together and divide by their number to get the average or mean value of the property. That this operation is by no means sufficient is seen from the graphs in Fig. 1, where the Samples *A* and *B* have very nearly the same mean but considerably different high and low values. It is necessary to estimate the spread of the values and so obtain a number which represents the irregularity of the property measured.

This can be done in several ways. The simplest estimate is called the "sub-mean irregularity" and is of special significance to the practical man, because it is based

on the distribution of the lower values of the property tested. The sub-mean irregularity is defined as:

$$\frac{M - M'}{M} \times 100\%$$

where M is the mean of all the test values, and M^1 is the mean of all the test values which are lower than the mean.

There is also a "super-mean irregularity," defining the distribution of tests higher than the mean, but it is not so important as the sub-mean which defines the range of those elements in the product which are below a standard mean and which are likely to give trouble either in subsequent processing or use.

Sometimes it is not easy by the method of visual judgment to determine when the frequency graph has reached a steady state and, where there is doubt about this, it is safer to handle the test values numerically.

The first of these checks is based upon the "Probable Error." The probable error of a single test value is a number such that the chances are even that this isolated value differs from the mean value, either above or below it, by the amount of this probable error. A still more important number is the "probable error of the mean of a group of tests," which defines that the chances are even that this mean differs from the mean of an infinitely large number of tests (the true mean obtained by perfect sampling), either above or below it, by the amount of this probable error. In the following discussion, we shall use this probable error of the mean and denote it by P.E. The probable error of the mean is found by the following formula:

$$0.674\sqrt{\frac{\Sigma D^2}{N(N-1)}}$$

in which N is the total number of tests made, D is the deviation (i.e., difference) of each from the mean of all the tests, and ΣD^2 is the sum of the square of the deviation of each test from the mean.

When the spread of the frequency graph is large, the value of ΣD^2 is big and the P.E. is large. For a frequency graph with narrow spread, representing a more regular product, the P.E. is small. Also the P.E. becomes smaller the larger the value of N, for the numerator ΣD^2 increases in proportion to $\sqrt{N}$ while the denominator increases in proportion to N. This explains why, in comparing the regularities of two products, by calculating the P.E.'s of the sets of test data, each set must contain the same number of tests.

Another numerical check is called the "Standard Deviation," abbreviated S.D. It is the average squared deviation and represents the closeness to which the test values are grouped about the mean. The standard deviation is found by the following formula:

$$\sqrt{\frac{\Sigma D^2}{N}}$$

Unlike the P.E., the S.D. is independent of the number of tests, providing adequate sampling is secured, for the square root of ΣD^2 and of N is involved in the calculation.

For any set of test data, the values of the P.E. and S.D. determine the efficiency of the sampling. If this is satisfactory, then, on increasing the number of tests, the S.D. will remain constant while the P.E. will be reduced, the latter in the ratio of 1 to $\sqrt{2}$ if the number of tests were doubled. When this is the case for sets of test data intended for comparison, we can be sure that the numbers of tests made are sufficient to justify our drawing conclusions as to the relative merits of the samples with safety.

In making this comparison, we should note that the difference between the means of any two sets of data is uncertain, owing to the P.E.'s of the means themselves. The extent of this uncertainty may be judged by expressing the P.E. of the difference of the means in terms of known P.E.'s of the individual sets of data, by the formula:

$$\text{P.E. of the difference of the means} = \sqrt{(\text{P.E. of the 1st mean})^2 + (\text{P.E. of the 2nd mean})^2}$$

If the difference between the means is more than three times the P.E. of the difference, then it is unlikely, 23 to 1 against, that the samples are equivalent. If this ratio were 13, as is sometimes the case in comparing supposedly similar yarns, the chances against the difference being due to sampling are about 500,000,000 to 1, so that to this high degree of certainty we may say that the difference is real. If this ratio is less than three, the difference is assumed to be statistically insignificant and considered to be one due to sampling. Such products would be judged as equivalent.

In the above discussion we have purposely refrained from specifying the nature of the property under test. It may be strength, sizing, twist, etc., for yarns and threads, and the methods outlined may be used in judging the regularities of rovings, slivers, and even laps, and the distribution of fiber lengths in various grades of cotton. Such analyses give valuable information concerning the performances of alternative machines or modifications in processing. Particularly are these methods advantageous in comparing the relative merits of high- and low-draft systems, and it is mainly by such analysis that we can safely say whether the installation of high drafting on any system is profitable or not. Not only this, we can even estimate the percentage gain or loss resulting from any system of operations, or the effect of any modification, such as roller settings, weighting, covering, etc., which the spinner may desire to make.

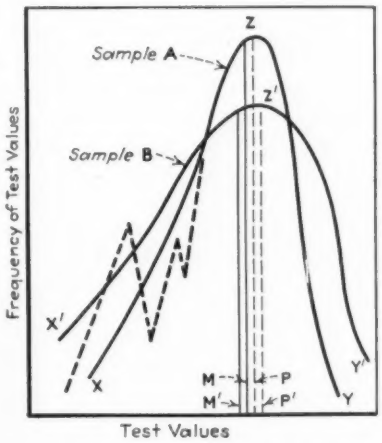


Fig. 1. Results of tests plotted as graphs for ease of comparison

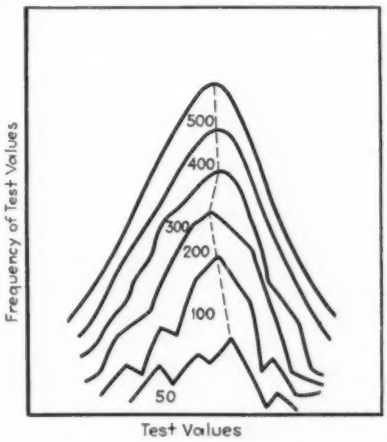


Fig. 2. Testing must be continued until the shape of the graph becomes "steady."

Harshness

Of crossbreds can be overcome by suitable finishing agents

By G. L. Atkinson

THE principal aims in finishing crossbred serges and similar light-weight dress goods are to prevent damage to the goods by overworking and to overcome the natural harshness of the fiber. With many fabrics it is possible to obtain the desired softness in the preparing department. However, the type of material which we are considering is far from robust and should be subjected to as little processing as possible. For this reason, it often is advantageous to use a softening compound for finishing these goods.

After the cloth has been weighed and measured in the gray room, it is sewn together in batches of four to six pieces, a cotton wrapper being attached to each end of the batch. It is preferable to beam the goods before crabbing. Crossbred serges should be given as light a crabbing as possible and still set the fabric. With a two-bowl crab, for example, the writer boils up the liquor before the goods are entered, runs in the goods under just sufficient tension to prevent cockling, boils for 3 to 4 min., runs the goods onto the second bowl, and crabs for another 3 to 4 min. As a rule, it is neither necessary nor advisable to steam the goods after they have been crabbed.

The scouring time should also be reduced to the minimum which is compatible with complete removal of the impurities. Likewise the temperature should be kept as low as possible. It is necessary, however, to wash the goods thoroughly with warm water after they have been scoured. In too many plants, the scouring-machine operators have fallen into the habit of opening the cold-water valve before all of the soap is rinsed from the fabric. This often results in the fastening of the residual soap on the goods and leads to unevenly dyed, shaded, or listed pieces. The following procedure will be found to give good results: Scour in soap, 15 min.; rinse with warm water, 10 min.; scour in soap, 20 min.; wash with warm water, 35 min.; rinse with cold water, 25 min. Recently certain chemicals have been made available which facilitate removal of soap from textiles, and addition of one of these to the wash water permits a considerable reduction in the time required for rinsing. Two precautions which should be taken in scouring are to keep the goods well drafted out and to avoid excessive tension.

In handling fabrics of the type under consideration, the dyer should endeavor to observe the same general rules as apply to scouring. That is, the operation should be carried out in as short a time and at as low a temperature as possible, excessive tension should be avoided, the goods should be well drafted out, and the rinsing should be thorough. After dyeing and rinsing, the pieces are removed from the machine and are extracted to remove excess moisture. They are then treated with a softening agent and dried on a tenter dryer. The softener can be applied on a padder, or in an ordinary rope dolly fitted with a trough for holding the solution. When the dolly is used, the common practice is to run the goods for about 20 min. at 120° F. through a 2 to 3% solution of the emulsifying agent. Formerly olive oil or castor oil emulsions were employed almost exclusively. Today there is available a wide variety of proprietary compounds, many of which are being used with excellent results. Without going into any discussion of the properties or merits of different types of softeners, it can be said that it pays to buy the best and—when good results are being obtained—not to change to a cheaper product merely because it is offered at a little lower price.

Drying presents no particular problems, the chief precaution being to make certain that the goods are not overdried or baked. Shearing is carried out by first giving the goods three runs on the back on a hollow- or spring-bed machine, following this with one run on the face. Occasionally the pieces are given a final run on the face on a solid-bed machine, but for the type of finish usually required on these goods this operation is unnecessary.

Steaming and Pressing

The goods are now perched, and those pieces which are free from faults are passed on for the final finishing operations of steaming and pressing. Steaming is carried out with the fabric under moderate tension, the pieces being run off at steam heat with no attempt at cooling. Excessive heat should be avoided in pressing, remove laying marks and creases without reducing the moisture content of the fabric more than is necessary.

It will be found that the routine described above will give a better finished appearance and softer handle than is usually obtained on serges made from crossbred wools. The fabric will be soft and free from objectionable shine and will have good tailoring properties.

In the scouring and dyeing operations, the goods should be well drafted out and excessive tension avoided.

End of a D-13 Year

Annual report covers adoption of S-Z twist, cotton tests, wool Typp, silk-rayon shrinkage

◆ *A feature of the Detroit meeting of the American Society for Testing Materials was a paper by Werner von Bergen on testing the properties of wool. A summary of the paper is contained in this report.*

THE fact that Committee D-13, the group of men which heads most of the standardization work in the textile industry, is a part of a much larger group—the American Society for Testing Materials—has several advantages, but also one disadvantage—namely, that the annual meeting of the entire society is not necessarily held in or near an important textile center. Thus this year's meeting, held the week of June 24, was placed at Detroit, Mich.; and D-13, rather than run the risk of finding too few of its members present for properly carrying on its sub-committee work, wisely confined its activities to the presentation of its annual report to the parent society and the reading of one paper.

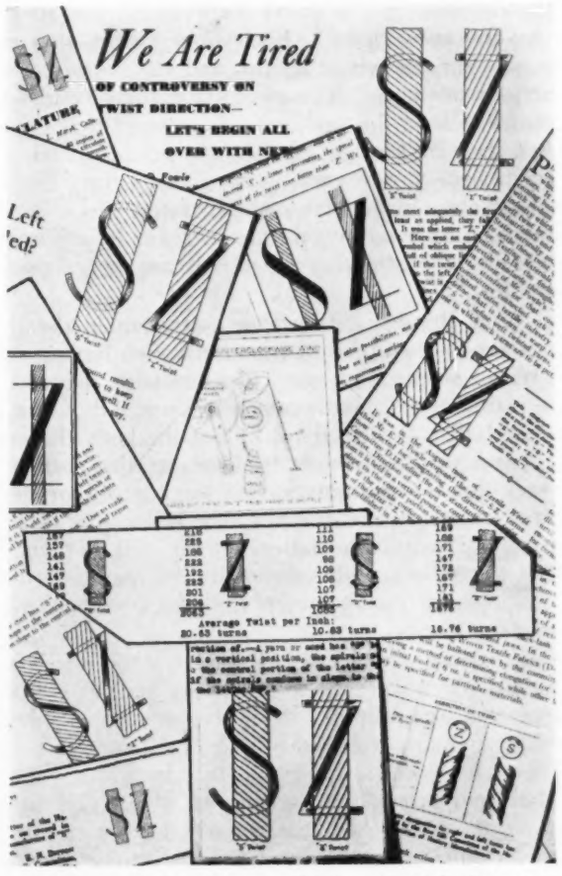
But the annual report which Prof. H. J. Ball, chairman of D-13, presented to the society this year was an outstanding one, representing a year of great effort and achievement and, in many matters, a year of courageous pioneering. Its acceptance by the society means that the numerous recommendations it contained for the advancement of proposed standards or for revisions in previously adopted standards receive A.S.T.M. sanction.

Because it represented the end of the longest and most severe controversy which has rocked D-13 in all its twenty years of existence, the adoption of the terms "S" and "Z" as tentative standards for designating the directions of twist in yarns was considered to head the list of achievements. The following definition now takes its place in the official books of the society: "A yarn or cord has S-twist if, when held in a vertical position, the spirals conform in slope to the central portion of the letter 'S,' and Z-twist if the spirals conform in slope to the central portion of the letter 'Z.'" These new terms, proposed originally by TEXTILE WORLD last August, are being considered for international adoption by the International Standards Association, following recommendations made by the American Standards Association and by Deutscher Normenausschuss, the German standardizing body.

Crowding for the position of second importance are the tentative standards for testing cotton-fiber length, length distribution, fineness, immaturity, and strength; for testing the shrinkage of silks and rayons; for testing the strength of rayon fabric when wet; for permitting the use of the constant-rate-of-load type of tester; and for numbering woolen and worsted yarns by the Typp system. If the same criterion of importance that was used to measure the first achievement is to be used to measure the second—that is, the courageous ending of what seemed to be a hopeless controversy—the adoption of the Typp system unquestionably takes second place. This likewise was originally a proposal of TEXTILE WORLD's (April 23, 1932) and the system has since been adopted by the National Bureau of Standards for all yarns. Into the woolen and worsted sections of the A. S. T. M. books now goes the statement: "The number of a woolen [or worsted] yarn shall be the number of thousands of yards per pound (Typp system)."

Numerous other progressive steps were reported and received sanction at Detroit. These included revisions in the tentative standards for estimating wool yield; for testing rayon yarns; for identifying fibers and quantitatively analyzing textiles; and for specifying and testing tubular sleeving and braids, woolen yarns, and worsted yarns. Revisions were also made in previously adopted standards for testing all woven fabrics, and for specifying and testing tire cord, hose and belt ducks, and cotton sewing thread. Specifications for holland cloth were advanced from tentative standard to standard.

Impressive as all these accomplishments appeared, they were no more inspiring than Professor Ball's report of the present activities of the numerous sub-committees of D-13—a report which indicated that the D-13 year



Evidence of the wide-spread interest which the new terms for designating direction of twist have created since they were first proposed a year ago is shown by the above clippings. Represented are several American textile journals including TEXTILE WORLD, *one English textile journal, a house organ of a machinery builder, an advertisement of another builder, a report from a prominent commercial testing house, and, most important of all, the annual report of Committee D-13.*

just beginning will offer further advances in the important work of textile standardization.

The single paper was presented before the entire society by Werner von Bergen, Forstmann Woolen Co., Passaic, N. J., and was entitled "Testing of the Physical and Chemical Properties of Wool by Means of the Microscope." In his introduction, Mr. Von Bergen pointed out that the wool sub-committee, while setting up tentative standards for woolen and worsted yarns, came to the conclusion that the highest value could not be derived from these standards without the setting of standards on the wool fiber itself. Therefore he offered his paper as a basis upon which the missing essential standards could be developed.

He began with a detailed description of the structure of wool fiber; and among the more interesting of his remarks on this subject was the following: "In kemps, the medulla forms the main part of the fiber—90% or more. As with other fibers, only the cortical layer absorbs the dye; therefore the kemps are much lighter in color" than other fibers dyed simultaneously.

The main part of the paper was devoted to methods of determining wool fineness. The common method, which consists merely of handling and observing the material, is rendered inaccurate by variations in the color and luster of the hairs and by differences in the light by which the hairs are examined—weak light giving an impression of fineness and strong light an impression of coarseness. "The main difficulty in the way of establishing a scientific method," Mr. Von Bergen said, "is the fact that the diameter of the fiber varies between 10 and 30 microns in the finest wool and from 10 to 70 microns in coarse wool. Each fiber varies also in its thickness over the whole length, and the cross-section is not circular in shape." The most astonishing results were found by Winson, he said, who discovered that the progressive scale of fineness in accepted grades of wool are in geometric progression—supporting the Fechner-Weber psycho-physical law, which states, "In order that the intensity of a sensation may increase in arithmetical progression, the stimulus must increase in geometrical progression."

Mr. Von Bergen outlined in considerable detail the three methods for fiber examination which have resulted from recent research on wool measurement; namely, the width, cross-section, and gravimetric methods. He recommended that for practical mill work both the cross-section and width methods be used, as the former "is necessary for the examination of the contour or degree of ellipticity and is best suited to the making of standard photographs," while the latter "is the simplest and the quickest to perform and is necessary for the longitudinal examination" of fiber evenness and the condition of the epidermis.

In discussing a miscellany of uses for the microscope, other than for fineness determination, Mr. Von Bergen declared that an examination of the amount of swelling caused by applying a few drops of N/10 caustic soda to the fiber will disclose the extent to which the wool has been damaged by sunlight and by peroxide bleaching and will indicate simply and quickly whether or not it has been chlorinated. "A 5% solution of caustic soda at a boiling temperature dissolves wool completely in a few minutes. Soda ash, potash, and ammonia are not so destructive to wool, but should not be used over 130° F. or in a concentrated solution." He outlined the microscopical methods which are suitable for testing damage caused by alkalis, acids, mildew, and bacteria.

Diesel engine merits consideration as a source of

Supplemen

UNTIL recently, the general belief has been that for the generation of power in textile mills the diesel engine offers no advantage over the usual types of equipment. It now appears, however, that in many instances the diesel could well be used as a supplementary source of power. In fact, a number of plants —particularly in the South—have installed diesels as the main source of power. Points commonly raised against the diesel are its high initial cost and complicated construction and its failure to provide exhaust steam for processing purposes. Let us examine the validity of these major objections in the light of the more recent developments.

Formerly a steam plant could be installed for considerably less than a diesel plant of equal capacity, but improvements in the construction of the latter, and the greater complication of the modern steam plant, have placed the two types of power generating equipment on a fairly equal basis. Furthermore, it is estimated that the length of life of the two outfits under the same operating conditions will not be very different.

Although a diesel engine is a much more complicated machine than either a steam engine or a turbine, any true comparison must take into account the entire steam outfit, including boilers, superheaters, stokers, forced-draft apparatus, condensing equipment, feed pumps and heaters, together with all the smaller devices which go to make up the modern steam power plant. While an oil engine is complicated, all accessory equipment is included with the main unit in a single structure. For these reasons, the diesel makes a good showing as regards simplicity when the comparison is made between the two entire plants.

We now come to the matter which is usually advanced as a deciding factor against the use of an oil engine in

tary Power

By Charles L. Hubbard

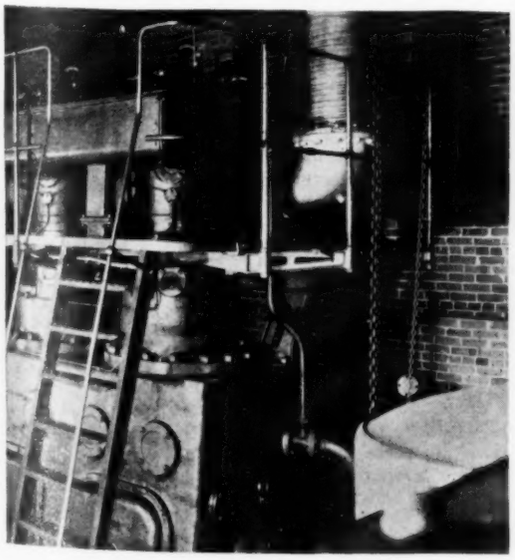
a textile mill; that is, the lack of exhaust steam for heating purposes. Although results vary somewhat in different cases, the following data, based on a number of tests of diesel engines ranging in size from 200 to 500 hp., show about how the heat is distributed and may be used as a basis for the illustrations given below:

Heat absorbed by cooling water.....	32%
Heat lost in exhaust gases.....	26%
Heat lost in friction.....	9%
Heat utilized in useful work.....	33%
Total heat supplied to engine.....100%	

It is well at this point to state that the thermal efficiency of this type of engine is but little affected by the size of the unit, tests at hand showing an oil consumption of 0.42 lb. per horsepower per hour for a 500-hp. engine, and 0.40 lb. for a 750-hp. machine, both operating at full load. Likewise, the effect of load variation on fuel consumption is much less than in case of a steam engine; the figures given above increasing only to 0.48 lb. per horsepower per hour in both cases when the load is reduced to one-half normal rating.

On the other hand, the boiler and engine of a well-designed manufacturing plant may have a combined thermal efficiency ranging anywhere from 5 to 10%, with possibly a slightly higher figure in the latest installations of the highest class, compared with a fairly uniform efficiency of around 30 to 35% in the case of a diesel plant. Reducing the load on a compound high-speed engine to one-half its rating will increase the steam consumption about 25%.

Now let us see what can be done in the way of salvaging heat from an oil engine. If the jacket water is pumped through a system of radiation, where it is cooled through such a temperature range that it can be used over and over again, we can count upon utilizing practically 100% (neglecting pipe-line radiation) or the whole of the heat absorbed by the cooling water in its passage through the jackets. In case of the exhaust gases it will be possible ordinarily to extract only 50 to 60% of the contained heat, although a somewhat higher percentage can be obtained with specially designed equipment. That is, under favorable conditions we should be able to save about 48% of the heat of combustion of the oil supplied to the engine.



In the case cited, a 500-hp. engine required 0.42 lb. of fuel per horsepower per hour. Assuming an average heat value of 18,500 B.t.u. per pound, we find that it would be possible to reclaim about 1,865,800 B.t.u. per hour. This is equal to the heat given out by the condensation of 1,931 lb. of steam at 2 lb. pressure, or the equivalent of approximately 60 boiler horsepower. Expressed differently, we may count on salvaging about 3700 B.t.u. per horsepower of engine per hour. In mills in the North the available heat would be a substantial help at all times, and might, in some cases, provide all or a large part of the hot water required for process work during the summer when heat was not required in the buildings. In the South, where the winters are mild, the heat from a diesel engine would be a substantial help in warming the buildings, and might, in some instances, be considered as the major power unit by installing sufficient boiler capacity for furnishing steam for supplementary heating work. Pumps and other auxiliary equipment could be operated either by steam or electrically on purchased current, as seemed most advisable.

To see what could be done in the way of warming a building with the reclaimed heat from the 500-hp. engine which has been used as an illustration, let us take a building 50 ft. wide, 14 ft. high, with brick walls 16 in. thick, the usual proportion of window surface, and a roof of slate or matched boards. With inside and outside temperatures of 70 and 35° F., respectively, the heat loss would be approximately 1800 B.t.u. per running foot of length per hour. We have available for heating purposes 1,865,000 B.t.u. per hour; hence a building approximately 1000 ft. long, of the assumed dimensions and construction, could be warmed with an outside temperature of 35° F. For other outside temperatures the heat loss per running foot per hour would be approximately as follows: for 25° F., 2400 B.t.u.; 15° F., 2900 B.t.u.; and the length of building which could be warmed would be reduced to 777 and 643 ft., respectively.

It would seem that textile projects, particularly in the milder parts of the country, should be looked into rather carefully before deciding to install a complete steam plant, operating at a lower efficiency, in order to take care of the heating load for a comparatively small part of the year. It is well also to investigate the diesel when planning plant extensions, as this type of prime mover requires much less space than would be necessary for a steam layout of equal capacity with its additional boilers and auxiliary equipment. This condition alone is often a matter of much importance as it may save additions to boiler and engine rooms. The extent of the demand for process steam and other local conditions must all be considered in deciding upon the type of power plant equipment to be installed. Enough has been said, however, to show that the diesel engine merits investigation even in a plant where the heating load is a factor.

A future article will discuss methods for combining a diesel engine with an existing steam plant so as to utilize the salvaged heat to the best advantage.

Overseers'

THIS DEPARTMENT

offers practical material for the use of overseers in meeting the daily problems of their jobs. It includes valuable suggestions on industrial relations in the handling of which both the overseer and the superintendent are involved. Under the heading "Kinks" appear short cuts in mill technique which have already solved problems in at least one mill and may help in yours. The central panel features material from a mill superintendent's diary which offers practical hints on various matters taken from actual mill experience. We solicit your contribution to this department—see panel on opposite page for details.

▼

The Overseers' Responsibilities

Editor, Overseers' Corner:

The comments of Mr. Williams in the May issue are very interesting and instructive. His experience has been somewhat similar to that of the rest of us. Our overseers have had it made clear to them that their ability is above the average or they would not be overseers. This includes ability to lead others, develop efficiency, and organize work; in addition to purely mechanical skill.

The overseer has certain duties to perform, such as:

1. He instructs and trains operatives. The operatives are watched, and, when seen working in a difficult manner, they are instructed in the correct way.
2. He checks the work and eliminates mistakes. An operative may become careless and not up to his or her usual efficiency. The overseer is the one to discover this condition.
3. He distributes work so that where various weights or kinds of work are handled there is an equitable distribution.
4. He keeps the standard of workmanship high and maintains quality.
5. He organizes the work according to the best productive methods. This seems hard to do sometimes on the routine job, but frequently a study of the job reveals a better or simpler way.
6. He cuts down overhead. Sometimes there is a waste of time or material that may be stopped. There is also the job of checking the efficiency of the machines.
7. He corrects and stops erronous rumors. Frequently an erroneous report gets started and spreads, and it is the overseer's job to prevent such spreading.
8. He controls himself always. This may be hard at times, but an overseer who cannot control himself cannot control others.

JOHN P. SIMMONS

Cigarette as Robber

Editor, Overseers' Corner:

The innocent little cigarette that is smoked so contentedly by thousands of textile workers proves to be one of the worst leaks in the payroll.

Employees are forbidden to smoke in the workrooms, and when they want a drag they go to the washroom or outside the plant. What happens? Probably the greatest loss is the waste of materials while the operative is absent. While textile machinery is largely automatic, the presence of an operative is necessary to prevent inaccuracies, and when a thread breaks just as the operative is sneaking away for a smoke the loss is considerable.

The writer can recite cases where he has visited a washroom and found upwards of half a dozen men smoking and telling stories. Naturally the machines had been left in charge of an adjoining operative who will later on turn his machine over to the worker who has already enjoyed his drag, but suppose something happens in both operatives' sections at once?

A sensible rule seems to be that no operative should leave the job for the washroom without someone in full attendance on the work, and that the overseer should stand watch for any operative who would make the drag short, rather than take a chance on interrupted production.

Matches carried in the pockets, and accidentally drawn out with the handkerchief, may cause serious fires. The best plan is to have a supply of matches in the washroom and to prohibit matches in the clothing of the workers.

This question of smoking deserves more attention than it receives. Some operatives require a drag occasionally throughout the work period, and to deprive them of this dulls their efficiency. Shrewd and successful department heads are giving this subject careful consideration and it is only right that they should do so.

R. J. WALDO

Note: Mr. Waldo here raises the important question of whether it is better to take it for granted that operatives *will* smoke, and to make the best of the situation; or whether there should be definite rules and penalties for those who are caught. Any worth-while contributions on this subject will be welcomed and paid for.—*Ed.*

And the Girls?

Editor, Overseers' Corner:

Is there no possible promotion in a mill for a smart girl? In a department composed mostly of women an uncouth male boss is detested, while a sleek and handsome one is a disturber of the peace. In

From a Superintendent's Diary—

CARRYING OUT

(Based on actual mill notes)

AS a superintendent, I don't think that anything riles me as much as to have overseers pay little or no attention to the suggestions that I make. I know that this sounds a little wishy-washy and as though I weren't asserting my authority, but this is far from being the case. Naturally any overseer who defies my orders goes out of here so fast that his coat-tails fly. What I am thinking about are cases where I make a suggestion to one of the more competent overseers and then hear nothing further about it.

It is only natural to suppose that some of the suggestions I make to an overseer may not work out, but at least I want to know what happens. I find that in a number of such cases the overseer is in a rut and can't believe that anything but what he is doing is the proper procedure. Such an overseer doesn't say anything to me and just goes along his own way in the hope that I will forget about it all. I don't forget about such things and neither does any other superintendent. When I tackle such an overseer about not carrying out my instructions, the usual thing is for him to offer some sort of silly excuse. Whether such an overseer knows his stuff, mechanically, or not, he is on the way out as far as I am concerned because he will never progress. Any overseer who thinks he knows everything is practically dead as far as business is concerned.

Then again, some of the best overseers make the error of conveniently "forgetting" some of my less brilliant instructions or suggestions. When I have something to say, these overseers go

Overseers' Corner

SUGGESTIONS

By John Williams

out into their departments and do a good job of applying my ideas in most instances. Most times things work out, since I wouldn't be a superintendent if I didn't have good ideas most of the time. What I object to is to have such an overseer find out that one of my ideas doesn't work and then proceed to "forget" it. After a certain time, it is only natural that I should come boiling around to the overseer and raise the roof because my suggestion has not been carried out. The overseer may have a good excuse, but he is on the defensive and it takes a little time to get things ironed out.

The right way to do things is so simple that I sometimes wonder why overseers don't get wise to themselves. If I give an order, it has to be obeyed of course; and if anything goes wrong it is my fault. On the other hand, if I make a suggestion, it is up to the overseer to make every effort to see if the idea works. If the idea doesn't work, it is up to me to decide whether the overseer is in such a rut that he threw the idea out the window without trying it, or whether the idea simply won't work. I am always open to reason, I hope, and I have a great deal of respect for the overseer who comes to me and tells me frankly that my suggestion is not so hot. I may be able to convince him or he may be able to convince me, but at any rate we are dealing with facts. The overseer who thinks it best to "forget" has the cards stacked against him. If he is right, there is no reason why he shouldn't have spoken before, so I immediately start out with the supposition that he is wrong.

knitting mills the women have a chance, but I am talking about the other outfits.

I must admit that, as now organized, the section-hand's job is one of repairing and adjusting, but at least the best girl spinner is worth more as an instructor of new or less experienced spinners than she is as a tender of a certain number of sides. In the winding department, particularly, there are opportunities to reward skill with positions calling for the supervision of a number of machines.

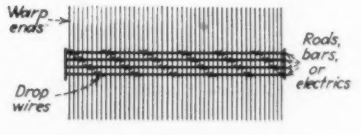
Greater recognition of women would lift the level of the work, provide incentive, keep the best workers, and attract better workers from the outside.

E. A.

KINKS

Making Drop Wires Drop

Probably everyone connected with a weave room has had the experience of having the warp-stop equipment fail to stop the loom when the end breaks. This is particularly true in the weaving of velvets and plushes, where a top and a bottom piece are woven at the same time.



The trouble is caused by the fact that either the wires are used for some time and become sticky because of sizing used on the warp, or they lose their smoothness through a change of atmospheric conditions.

The sticking of the drop wires can be prevented by the following system of applying the wires:

1. Put the *first* drop wire on the *first* end of the warp and on the *first* rod or electrode.

2. Put the *second* drop wire on the *second* end of the warp and also on the *first* rod.

3. Put the *third* drop wire on the *third* end of the warp and on the *second* rod.

4. Put the *fourth* drop wire on the *fourth* end of the warp and also on the *second* rod.

The sketch shows how the wires should be arranged.

The principal thing is that the wires are put on the rods in such a way that when the loom is in motion the drop wires on each rod will move alternately. This movement of the wires is easy to obtain if you follow the movement of the harnesses.

This system will prevent the drop wires from sticking together. They will drop easily and quickly stop the loom.

HERMAN HESSE

CONTRIBUTIONS

to the "Overseers' Corner" will be paid for without regard to length. We will be glad to use letters discussing the super's diary or any other pertinent matter whether of mechanical, managerial or just plain human interest. Those who contribute kinks will be paid additional for an appropriate sketch to illustrate their device. It is not necessary to submit finished drawings. If these pages interest you—contribute something to them to interest others. Address Editor, Overseers' Corner, Textile World, 330 West 42d St., New York, N. Y.

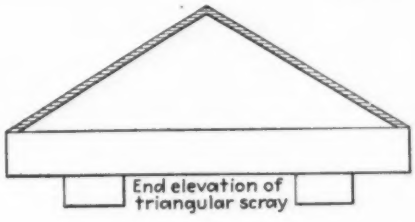
Scrays or Tables for Wool-Finishing Machines

In most cases where goods are cuttled on a scray or table the goods are warm or wet to a certain extent, particularly when coming off decatizing, steaming and tentering machines. As a result, a number of laying-marks, creases, etc., occur.

The writer has noted that most of the tables are flat-topped. A scray built as shown in the sketch will undoubtedly save its cost in the reduced number of marks and creases. This scray is built as a triangle, the sides being inclined. If, perhaps, a crease due to an air current occurs when the piece passes from the cuttling arrangement, the piece slides down the inclined face and the crease is obviated. This would not be the case if the table were flat-topped.

As a number of small stains occur because of rusty nails or screw heads, the scray should be constructed with wooden pegs or with rivets of non-corrosive metal. The last named are particularly suitable as they can be countersunk to obviate the danger of tears.

G. L. A.



Piping Practice...

Installation and replacement methods followed in more progressive mills

RECENTLY our Questions and Answers Department received an inquiry as to the methods followed by textile mills in the installation and replacement of piping for water and chemicals. Below we are summarizing our reply, which is based on information obtained from a number of the more progressive plants in various branches of the industry. While it is believed that many plant engineers and master mechanics will be interested in comparing the practice in those mills with their own, the data should be of particular value to the operators of small mills which do not have well-trained engineering staffs.

In the textile industry—and particularly in the various bleaching, dyeing, and finishing branches—piping is important as a means of conveying water and chemicals and is generally considered to be one of the primary factors in operation. Plant engineers realize that piping must be kept in first-class condition at all times to lessen manufacturing costs, avoid waste, eliminate accident hazards, and keep fire protection systems at highest efficiency.

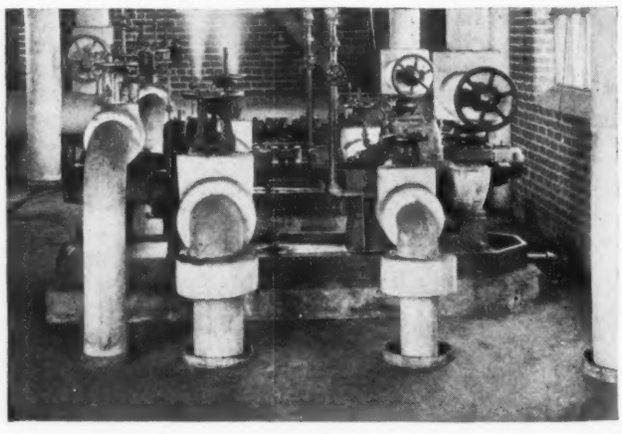
In the selection of water and chemical pipe lines, the following points regarding joints are considered: (1) tightness of joint; (2) permanence of tightness of joint; (3) labor cost of installation; (4) ease of disassembly for changes; (5) readiness with which materials or couplings may be obtained; and (6) first cost of installing or laying lines. On extreme high-pressure steam lines and gas lines welded joints are generally employed. Van Stone pipe joints are used on high-pressure steam lines. On sections of lines where it is necessary to put in replacement units, such as pumps, it is generally considered good practice to use flanged piping. In other cases, it is customary to use the screw-type piping. Welded joints are not commonly used in textile mills, except on the main steam line of the power house or on the trunk lines throughout the plant; they are advisable only on lines where there will be no call for changes or for new connections to be put in, where the material flowing in the pipes is not corrosive, and where the outside connections to which the pipe is exposed are not such as to cause serious deterioration. Threaded joints are the most common where there are numerous branch connections of various sizes and where there are likely to be frequent changes. Sleeved pipe couplings apparently are not used to any great extent. Gasket type (flanged pipe) is used in long mains where there are no branches and where there will be but slight call for new connections being made. For sizes of 6 in. and above, flanged pipe is used in preference to threaded, as the latter tends to wear out at the threads and eventually to leak at that point.

Frictional resistance in the transportation of water and chemicals is generally taken care of by installing ample pipe lines to provide for future deposits in the interior of the pipe and by using smooth-bore pipes, cement-coated pipes, etc., where practical. These problems frequently become as important as additional machines are installed and demand more flowage than that for which the original layout was planned. The problem also comes up at the extreme ends of the distribution system where the lines for any reason become more or less clogged with scale and deposit on the inside of the pipe. In making replacements in water and chemical pipe lines, or taking them down for cleaning and reassembling it is usually required that the job be done quickly. Sometimes speed is equally important in installing new lines or in rebuilding lines.

In replacing pipes which are generally worn out and in taking them out for cleaning, the flanged joint is considered one of the best to use. As a rule, engineers believe that—rather than to take down a line, clean, and reassemble it—it is generally cheaper and more satisfactory in the end, particularly on the smaller sized lines, to put in new pipes. Many times the pipe, besides being simply clogged, will be more or less corroded on the inside although it may look sound from the outside. This frequently happens with threaded pipes where the pipe wastes at the thread. Flanged pipe is more easily replaced than screwed pipe, as there are no threaded joints to be broken and only new packing is required. A new type of coupling which is designed to permit the making of changes in water and chemical lines without having to subject the pipe to a finishing operation such as threading or grooving, is attracting some attention.

Piping in dyeing and bleaching plants is often exposed to atmospheric conditions that tend to corrode the pipe on the outside. These conditions include moisture, acid or other corrosive vapors, and even droppings of corrosive liquids. Some engineers believe that regardless of the type of joint, anything less than a thickness of standard pipe is inadvisable, and that the final cost of a lighter pipe would be more. Other engineers believe that in most cases the heavier weights of pipe have been bought only to accommodate the thread; therefore, use of a lighter pipe is indicated when it will reduce the cost.

There is no standard practice in regard to the reclamation of sections of water and chemical lines when revamping or rebuilding the piping installation. The age of installation, nature of the material being passed, and inside and outside conditions of the pipe must be considered. As a rule, new pipe is installed, particularly on chemical lines. On the other hand, if there has been no exterior corrosion and the interior of the pipe has not been threaded, it is possible in many cases to salvage possibly 80% of water pipe.



Comparison of three samples of cotton of different maturities by means of color photomicrographs made by Prof. Schwarz for Pequot Mills and reproduced through courtesy of later.

Cotton Maturity

Becomes a readily determined factor as mills turn to the microscope

IN AN article entitled "The Cotton Classer" in our October, 1934, issue, page 80, Chesler L. Pattee explained how the Pequot Mills, Salem, Mass., determine the maturity of their cotton by means of the polarizing microscope. In the article which immediately follows, W. Edwin Stevens tells how Interlaken Mills, Harris, R. I., use the microscope for the same purpose, and he also offers a simple explanation of the scientific principles on which the work is based.

Beginning on page 91, Professor Edward R. Schwarz and G. H. Hotte, of Massachusetts Institute of Technology, Cambridge, offer support to the recommendations made by Mr. Pattee and answer questions which his article raised.

The whole movement toward the general determination of fiber maturity by means of the microscope is exceedingly interesting for two reasons: First, and of greatest importance, it permits the cotton mills to judge accurately and simply the most vital factor affecting the spinnability of their raw material. Second, it represents almost the first acceptance of the microscope by the mills as a common instrument for day-by-day use and so paves the way for the application of microscopy to the countless other textile problems to which it is adaptable.

Is the Fiber Ripe?

A polarizing microscope gives the answer at Interlaken

By W. Edwin Stevens
Interlaken Mills

NEARLY all of the cotton classers today use their own judgment, based on their experience, as to the character of cotton. The polarizing microscope offers a very practical means of accurately judging the character of cotton and will readily detect differences in value which may often escape the notice of even an experienced cotton classer. Strength, uniformity, and spirality, which are components of what we call cotton character, are dependent upon the maturity of the cotton.

The appearance of a matured fiber under a microscope is a long flattened tube with edges round and thicker than the center. The fiber is spirally twisted like a ribbon. The sap which fills the central part of the fiber, upon drying, probably causes the fiber to contract, which in turn causes it to twist.

The spiral effect is noticed most in matured fibers. Unripened fibers, under a microscope, show the center part filled. The edges appear more transparent, and the fibers have practically no twist. It is difficult to dye unripened fibers. They are one of the causes of neps.

Since cotton fibers are doubly refracting, a polarizing microscope may be used to determine the maturity of cotton. A microscope with a rotating stage, a polarizer, an analyzer, and a selenite (red of the first order) are needed. The apparatus is very simple to use, and the following explains how polarizing takes place.

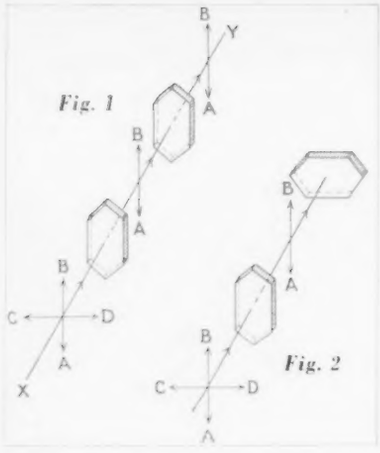
Light waves are transverse waves, and the vibrations of the light waves are at right angles to the direction of the light. Two crystals of tourmaline will prove this.

Since only the light-wave vibrations from source *X* (Fig. 1) which are parallel to the tourmaline crystals can pass through, the vibrations *CD* are eliminated. If the second crystal is parallel to the first, as Fig. 1 shows, the light passes through and the vibrations are only in the direction of *AB*. The light at *Y* will appear the same to the eye as at *X*, with its intensity slightly less.

If the second crystal is rotated 90° (Fig. 2), no light passes through it, since the vibrations are parallel to *AB* and not to the second crystal. As the second crystal is brought parallel to the first crystal, vibrations *AB* begin to pass through the second crystal.

This explanation may be summed up as follows:

1. The first crystal (polarizer) lets only vibrations



Figs. 1 and 2. A simple graphical explanation of the principle of light polarization

parallel to it through. These vibrations are only in one direction now and are called polarized light.

2. The second crystal (analyzer) has only vibrations in one direction to handle; i.e., vibrations parallel to the first crystal.

A similar thing takes place in the polarizing microscope. The Nicol prisms in the polarizer and the analyzer are sometimes made from a rhomb of Iceland spar, cut in two at an angle and cemented together with Canada balsam. The Nicol prisms serve a similar purpose to the tourmaline crystals.

In setting up the microscope, adjust the instrument to magnify 100 diameters. Place the polarizer in the condenser below the rotating stage. If the instrument has a cap analyzer, it is placed above the ocular. The selenite slides into the side of the tube on certain makes. A portable lamp, using a 50-watt frosted bulb, may be used for the light source. The light source should be the same intensity throughout the test, as a change in its intensity changes the intensity of the colors.

Take about 30 fibers from a classer's "pull" and place them between two slides. Do not allow the fibers to bunch, as you want to inspect them individually.

Have the Nicols of the polarizer and analyzer crossed to each other. With the Nicols in this position, no light is transmitted through the analyzer, as explained by Fig. 2. If the selenite is not in the microscope and the Nicols are crossed, the field will be black. Upon inserting the selenite in the microscope, the field will change to a shade of magenta. When the field is the darkest or deepest shade of magenta, you know that the Nicols are crossed. The selenite must be used when making a test, as the fibers are practically colorless without it.

Place the prepared slide upon the stage beneath the objective. Then rotate the stage in order to get the fibers which are to be classified parallel to the arrow on the selenite. This must be done before the classification can be made. Cross hairs in the ocular aid in bringing the fibers parallel to the arrow on the selenite. If the microscope has an ocular scale, the lines of the scale will serve the same purpose as the cross hairs. Rotate the ocular so that the lines of the scale are parallel to the arrow on the selenite. Now all fibers that are brought parallel to the lines of the ocular scale will be parallel to the arrow on the selenite. The reason why the fibers may be seen with the Nicols crossed is that the fibers are doubly refracting, thus the plane of polarization is rotated. Some of the polarized light is now able to pass through the analyzer.

Cotton fibers when viewed under the microscope, using polarized light, may show different colors, including indigo, blue, green, and yellow. Many times a single fiber will show more than one color. For example, a portion of its length may be blue while another portion is green or even yellow.

Extensive tests have shown that indigo and blue predominate in the weak, immature fibers and that the matured, strong fibers show green, yellow-green and yellow. Of course no lot of cotton can be made up entirely of fully matured, strong fibers. It therefore becomes necessary to have a practical scale for classifying the cotton fibers studied, and the writer proceeds as follows:

Ten consecutive fibers are classified from each of ten slides. If a fiber shows a continuous length of indigo, appearing in the field to the eye to be $\frac{3}{16}$ in. or more, it is called "highly unmatured." If a fiber shows a continuous length of blue, appearing in the field to be $\frac{3}{16}$ in. or more, it is called "unmatured." If it is a continuous length of green or yellow-green, it is called "matured." If it is a continuous length of yellow, it is called "highly matured." Green and yellow-green fibers are classified together because the colors are practically same shade.

It will be noticed that the unmatured fibers are at the blue end of the spectrum and that, as the fibers mature, they approach the red end.

As the fibers are classified, they are marked under one of the preceding headings. After the ten slides have been tested, the column of figures below each heading is added. Since 100 fibers have been examined, the totals will be in percentages. This method shows a very good and exact cross-section of the maturity of the cotton.

When classifying the fibers, it will be noticed that indigo changes to orange when the fiber is rotated to a right angle to the arrow on the selenite; that blue changes to yellow; that yellow-green does not change; and that yellow changes to yellow-green. This is why the fibers must be parallel to the arrow on the selenite when they are being classified.

The figures in Tables I, II, and III, taken from tests of two actual lots of cotton, clearly illustrate the practical value of this method. These two lots were to all outward appearance so nearly identical that the cotton merchant asked and received the same premium on each and the cotton classer found both lots entirely satisfactory. The polarizing microscope, however, indicated a difference; and the lots were run separately to see the practical results under operating conditions.

In all other similar maturity tests, the writer has always found the cotton with the highest maturity rating to give the best results (all other things being equal—i.e., length of staple, etc.).

TABLE I. Maturity Rating, Lot *A*

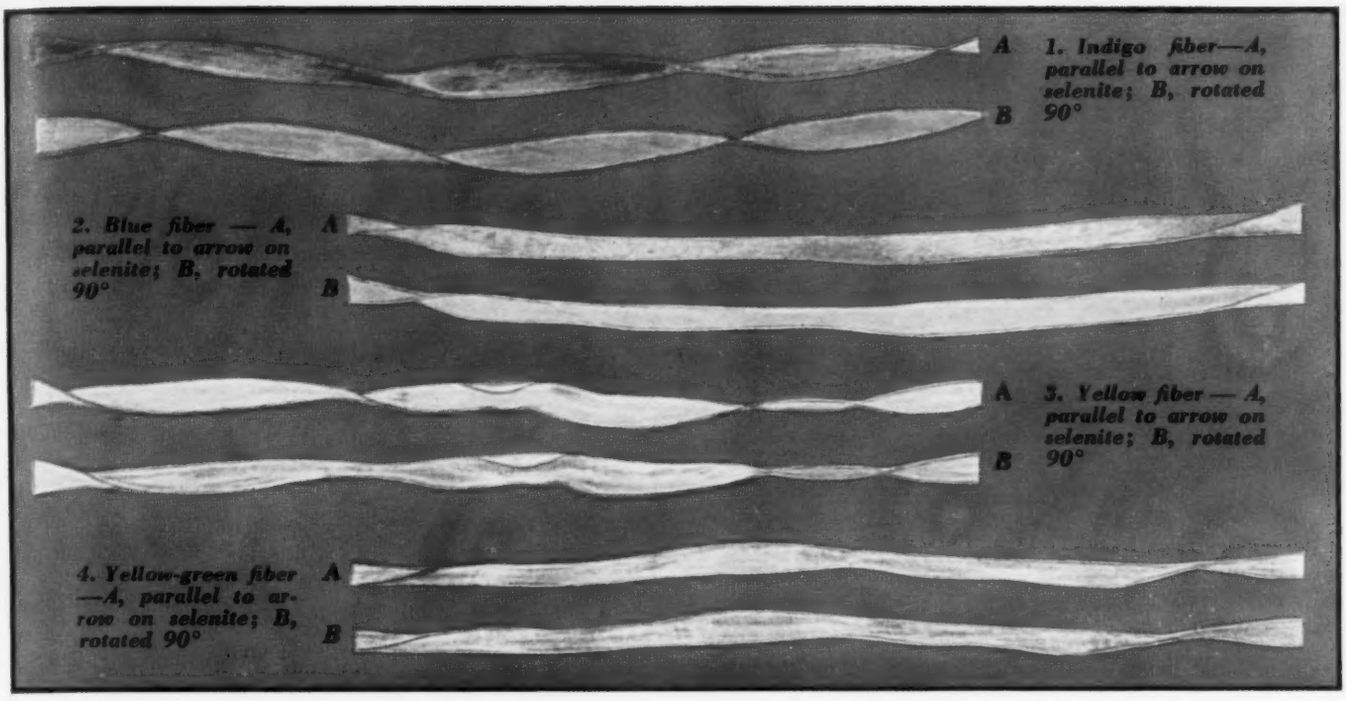
Highly Unmatured	Unmatured	Matured	Highly Matured
3	4	2	1
4	2	4	
5		2	3
	5	3	2
2	4	2	2
4	2	2	2
1	2	5	2
2	3	2	3
	4	1	5
2	1	1	6
23%	27%	24%	26%

TABLE II. Maturity Rating, Lot *B*

Highly Unmatured	Unmatured	Matured	Highly Matured
4	2		4
3	1	1	5
1	1	3	5
1	2	1	6
3	2		5
3	4	1	2
2	3	1	4
2	3	2	3
1	3	2	4
1	4		5
21%	25%	11%	43%

TABLE III. Tabulated Results

	28s Lot *A*	28s Lot *B*
Standard	28s	28s
Average No.	27.4s	27.4s
Correct No.	27.5s	27.4s
Ave. Strength	64.8	69.7
Corr. Strength	64.2	69.4
Ave. % Stretch	4.51	3.87
Lb./Gr.	1.76	1.90
Brk. Const.	1765.0	1900.0
Ave. Dev. Strength	2.6	2.1
Matured fibers	50%	54%
Unmatured fibers	50%	46%


A
1. Indigo fiber—A, parallel to arrow on selenite; B, rotated 90°
B
2. Blue fiber — A, parallel to arrow on selenite; B, rotated 90°
A
B
A
3. Yellow fiber — A, parallel to arrow on selenite; B, rotated 90°
B
4. Yellow-green fiber —A, parallel to arrow on selenite; B, rotated 90°
A
B

From drawings made by Mr. Stevens by means of a camera lucida and colored by hand from observations of the fibers through the polarizing microscope

Two different lots of cotton were put into process to make 28s warp yarn. The lots were kept separate, but were run on the same machines at the same time (from drawing through spinning). The classer claimed these two lots to be the same, except for the maturity. He did not give this, but the accompanying tables do.

From a study of the Maturity Rating Tables, I and II, Lot *B* cotton was predicted to give the best yarn. It will be noticed that the percentages for the highly unmatured and the unmatured fibers were added together in the Tabulated Results, Table III. This was done with the matured and highly matured fibers.

Although lot *B* had only 4% more matured fibers than lot *A*, it will be noticed from the Tables I and II that lot *B* had 17% more highly matured fibers than lot *A*. This accounts partly for the difference of 4.9 lb. in strength between the two lots. The test was made under standard laboratory conditions with 65% relative humidity and a temperature of 70° F.

Table III shows that the prediction was correct; that is, lot *B* cotton gave a much stronger yarn.

Determining the maturity of cotton by using the polarizing microscope is a comparatively recent development, but it appears to offer very practical advantages. By finding the maturity rating of the different lots of cotton, it is possible to mix the cotton in such a manner that the maturity rating will stay near the mill standard, thus preventing a drop in the yarn strength.

We have found that lots of cotton which show 55% mature fibers in the Maturity Rating Tables prove satisfactory under actual running conditions and give the breaking strength expected from the staple used. Our actual cotton will often show as high as 65% mature fibers with correspondingly better results in the actual yarn tests and without extra premium for the cotton.

It is not unusual to find cotton which has the proper length of staple but which shows as low as 30% mature fiber.

Those interested in applying the polarizing microscope to their own cotton problems will find it helpful to refer to the book "Textiles and the Microscope," by Edward R. Schwarz (McGraw-Hill Book Co., New York.)

Notes on Technique

For determination of fiber maturity by polarized light

By E. R. Schwarz and G. H. Hotte
Massachusetts Institute of Technology

RECENT work described by Pattee[1] and based on previous findings by Schwarz[2] and Herzog[3] has evoked a certain amount of comment and criticism. In this brief discussion, therefore, certain data are presented in support of the method proposed by Pattee and in some measure as an amplification and clarification of his technique. It has advantages over the swelling technique.

Fibers selected by means of their characteristic behavior in the polarizing microscope have cross-sections which are definitely separable by measurement and appearance into distinct groups. Further, the wall thickness of the smallest cotton fiber (Sea Island) in the mature state is greater than the wall thickness of either the fully immature or the partially immature fibers of the coarsest type (Indian). [Detailed proof of these matters was offered by the authors in a more complete discussion of the subject published in the June issue of *Textile Research*.] Thus the objection to the polarized light method raised by certain workers—namely, that the technique will not allow of distinguishing between a small-diameter mature fiber and a large diameter immature fiber—is shown to be based on what is certainly a remote possi-

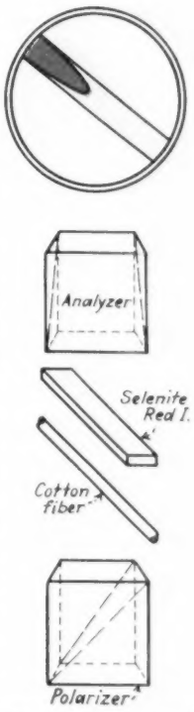


Fig. 1. Arrangement of polarizing equipment

bility. Furthermore, the method does not depend entirely on the colorization of the fibers; and a neglected feature of the technique positively eliminates any possible difficulty.

Osborne[4] has shown (in corroboration of less elaborate work by Herzog[3], that cuticle and primary deposit of the wall of the cotton fiber have a differently oriented structure from that of the secondary deposit. The latter is strongly spiraled, as has been demonstrated by quite different techniques in the hands of Morey[5] and Preston.[6] The former has a parallel arrangement of the molecular structure. The secondary deposit on the upper half of the fiber is spiraled across the direction of the helices of the under side of the fiber. In addition, and because of the great variation in the angle of the helical structure from outer to inner limits of the secondary deposit as well as from point to point (as close as 50 microns) along the fiber, total extinction is lacking no matter what the orientation of the fiber may be with respect to the planes of vibration of the polarizer and the analyzer. Thus rotation of a normal (fully mature) cotton fiber through 360° fails to show any position of even approximately complete extinction.

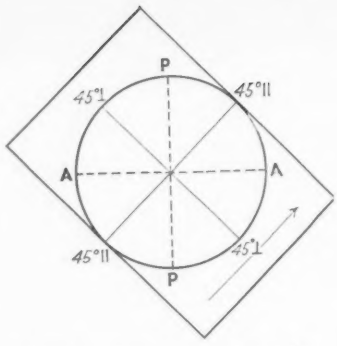


Fig. 2. Positions to which fibers are rotated

This behavior is to be contrasted with that of the immature fibers. Since these consist almost entirely of cuticle and primary deposit, they do show practically complete parallel extinction. There is evidently no possible chance for confusion between mature and immature fibers—no matter what the diameter or wall thickness. The fundamental difference is one of orientation of structure. The classes of maturity which fall between these two limits naturally show combinations of the two appearances above noted. It is possible definitely to select fibers belonging to two classes between the extreme limits. Cross-sections of these show them to be in distinct groups with no over-lapping.

The apparatus employed for the immaturity (or maturity) count for cotton fiber by means of polarized light is based preferably upon a microscope of the petrographic type. Polarizing microscopes manufactured by the leading optical companies should be used, since, because of their long experience in the construction of such microscopes, one can be certain of dependable instruments. The microscope should be fitted with a 16-mm. (10x) objective and a 10x focusing ocular. This will give a convenient number of fibers in a single field of view and, at the same time, provide sufficient magnification for easy differentiation of the coloration and extinction effects in the fibers.

A polarizing prism of standard design is used in the substage, while an analyzing prism in the body tube—rotatable through 90°—is most suitable. A rotating stage to which a mechanical stage is attached is essential for controlled manipulation of the specimen. A good condenser of the focusing type with a removable (or tilting) top element placed above the polarizer is desirable. Both coarse and fine adjustments for focusing should be provided. The cross hairs in the ocular should be capable of adjustment (by rotation of the ocular) to a fixed position at 45° with the planes of vibration of the polarizer and analyzer when the latter are crossed. The focusing ocular is essential if projection or photography is to be used, in order to insure perfect focusing of the cross hairs.

The positions and settings of the various parts should be according to directions, in order to obtain the desired results. A first-order (Red I) selenite of the slot type is inserted in the slot provided just above the objective—and below the analyzer. If a selenite disk is used it must be inserted between the polarizer and analyzer with its slow vibration direction—as indicated by the marking on the disk—oriented 45° with the planes of vibration of polarizer and analyzer. This may be done by placing it just above the polarizer or, better, above the ocular and below a cap analyzer, when one is used. The body tube (slot-type) selenite is much more precisely mounted and is to be preferred. For the relative arrangement and orientation of the parts, see Fig. 1. A constant light source should be used—identical for all determinations.

The method of evaluating the maturity count follows, and reference to Fig. 2 will make the instructions clear. The fibers are arranged substantially parallel with each other and with the slow vibration of the selenite.

Each fiber which is clear purple or deep blue, or a combination of these colors in alternation, along the entire visible length in position 45° parallel is counted two demerits. These fibers are immature and, if rotated into the 45° perpendicular position, become orange or yellow. As they pass the planes of vibration of the polarizer and analyzer (*AA-PP*) they turn to the same color as the background (Red I) or "extinguish."

A fiber appearing partly blue or blue-green, or both, which upon rotation to the 45° perpendicular position becomes yellow is partially immature and is counted one demerit. Fibers which are yellow or yellow-green throughout their entire length, and which remain this color when rotated to the 45° perpendicular position, are mature. These are not given any demerits but are counted toward the total number of 50 to be rated for each test. If all 50 fibers were immature, the demerit rating would total 100%. If all were partially immature, the demerit rating would be 50%. If all were mature, the demerit rating would be 0%. If a maturity count is desired, the demerit rating is subtracted from 100%. Obviously the demerit rating will be a combination of both immature and partially immature fibers.

The counting and evaluation of the fibers may be accomplished by a number of techniques. Simple recording of results with pencil and paper, or more elaborate methods employing counting devices, can be used. [Three techniques were described by the authors in the more complete discussion published in the June issue of *Textile Research*, and at that time advice was offered on selecting and preparing the samples of fiber.]

The fibers may be mounted dry between two glass slides held together by Scotch tape. Other methods of fastening the fibers to the slide can be employed; but no mounting medium, such as Canada balsam, is necessary.

●

[1]Pattee, C. L., TEXTILE WORLD, October, 1934.

[2]Schwarz, E. R., "Textiles and the Microscope," McGraw-Hill.

[3]Herzog, A., "Mikroskopische u. mechanisch-technische Textiluntersuchungen," Springer, Berlin, 1931, p. 142.

[4]Osborne, G. G., *Textile Research*, April and May, 1935.

[5]Morey, D. R., *Textile Research*, Vol. IV, No. 11.

[6]Preston, J. M., "Modern Textile Microscopy," Emmott.

ADVERTISING PAGES REMOVED

It's Like Fishing

This cotton-mill business, S.T.A. men are told

SPINNING, weaving, and other problems of management were discussed at the spring meeting of the Northern North Carolina-Virginia Division of the Southern Textile Association, held June 8 at Gibsonville, N. C. L. J. Rushworth, superintendent of the Riverside division of Riverside & Dan River Cotton Mills, Inc., Danville, Va., and vice-chairman of the division, presided in the absence of Chairman James A. Bangle, of Greensboro, N. C.

Culver Batson, president of the S. T. A., opened the meeting with a brief address on "Fishing," in which he compared certain phases of Isaac Walton's art with the operation of a textile mill. In both cases, said Mr. Batson, bait is essential in the form of attractive worms, flies, or designs. Equipment must be properly selected and kept in repair—or the line will break and the fish will get away. Other common factors are patience and proper temperament.

M. W. Heiss, of Greensboro, also spoke briefly. W. J. Jennings, carder and spinner, Minneola Mfg. Co., Gibsonville, N. C., led the spinning discussion.

Answering the first question, "Do you have more fly with long-draft spinning than you did with the short?" S. T. Anderson, assistant superintendent Carolina Cotton & Woolen Mills Co., Draper, N. C., said that he has more fly with long-draft spinning and finds it more difficult to keep the frames clean. He attributed this condition to the elimination of the fine frame and to the fact that there is less twist in intermediate roving. Mr. Jennings reported that large-package filling roving, "in about 40 different colors," running 37 hr. and 45 min., collects quite a bit of lint, and the colors intermingle. J. A. Simpson, overseer of spinning, Virginia Cotton Mills, Swepsonville, N. C., declared that oil reduces his fly 25% and tends to keep the colors from mixing. He also suggested placing a veneer board between each two colors. Mr. Anderson said that when spinning 16s and 26s yarn on the Casablancas long-draft system, equipped with an underclearer, he cleans all the rolls every six months, and the top rolls every three months.

With reference to the life of cork rolls, Mr. Jennings remarked that temperature, humidity, and preparation of stock are factors in their longevity. He added that such rolls might last from one week to two years, since a single hard end often makes rebuffing necessary. Mr. Simpson reported that he has been using cork for several years and finds it particularly valuable on back rolls, where the speed is not great. At 180 r.p.m., he said, cork shells tend to become one-sided.

J. A. Rudisill, card grinder, Minneola Mfg. Co., Gibsonville, explained that in changing from leather to cork, the weight on his spinning-frame rolls was not changed. Mr. Jennings added that, although the weight was unchanged, the lever stirrup was moved in order to compensate for the long-draft changeover. Another member reported that in changing from sheep to cork, the weight on the roll was not changed, and no lap-ups or cockled yarn resulted.

Opinion was divided as to improvement in yarn quality upon changing from leather to cork. Cork's strongest supporter was Mr. Jennings, who asserted that the quality of his yarn, made on long-draft frames equipped with cork, is excellent. He reported that in breaking 63 yd. of 26s warp, 4.56 twist multiplier, 15/16 in. middling cotton, 57% humidity, he found that the yarn would stretch from 1½ to 3 in., averaging 2.21 in. It was agreed that this was excellent yarn since a 2-in. stretch is considered good.

Chairman Rushworth led the weaving discussion.

Consensus was that dressing is desirable for leather belts on narrow looms. J. R. Copeland, general superintendent, E. M. Holt Plaid Mills, Burlington, N. C., suggested that a 50% solution of neats-foot oil and castor oil used weekly is good. This is usually applied with a 1-in. paint brush held lightly against the belt through one revolution.

Opinion varied slightly as to what should be the maximum speed for a slasher on 3000-end sets with 15% size in the yarn. Mr. Rushworth reported that on 22s yarn, 8% size, he operates his slashers at 35 to 40 yd./min. R. K. Craven, overseer of weaving, Minneola Mfg. Co., Gibsonville, said he runs 1600 ends of 26s yarn at 40 yd. per min. Several members reported sized yarn sticking to the cylinder. The majority agreed that clean cylinders, proper temperature, and proper size mix would prevent this sticking.

Following the technical discussion, three new members were elected to the executive committee, as follows: L. D. Andrews, Martinsville, Va.; L. A. Elmore, Rhodiss, N. C.; and J. R. Copeland, Burlington, N. C. The entire division was the guest of the Gibsonville members at a luncheon.

QUESTIONS AND ANSWERS

Silk Fabric Pulls In

Technical Editor:
I shall appreciate your opinion on what causes a fabric woven with the following construction to pull in on the edges and in some cases cut the reeds: 3/2/60, 22,050/1, 2-ply warp, 24/26 yellow Japan; filling, 2-thread 20/22, 60/65 yellow Japan silk, 112 picks; measuring 61¼ in. in the loom; width in the gray, 60¼ in.; warped on paperless beams; looms equipped with lever weights and let-off. We do not want to use temples, as we are afraid that the temple marks will show up in the finish. (8230).

There is no apparent reason why you should have trouble in running a fabric of this construction. A number of mills are running the identical fabric, using let-offs, levers; and paperless beams and making the warps 2000 yd. long without having any trouble of this character.

We suggest, however, that you release the tension on the springs which hold the reed cradle so that your reed will swing at least ½ in.

The time of the loom should be set so that the harness is level when the crank arms are slightly above front center. This should be so on both picks. Also, when the loom is in motion, we suggest that you hold your hand on the edge of the cloth to determine whether the shuttle is being forced through the shed. If it is, adjust your picking motion accordingly. Again, while the loom is in motion, watch the shuttles as they arrive in the shuttle boxes to see if they are dragging the shed.

Examine the filling tension to make certain that it does not pull too hard. It should be free and smooth. The tension on the warp should be adjusted so that it is not too great, but it should be sufficient to avoid hand marks. We also suggest that your warps should measure at least 62½ in. between flanges.

On no account use temples, as they will cause an imperfection which is very pronounced after the cloth is finished. If the loom is in good condition and set properly, there is no need for temples. On fabrics of this type they are more of a hindrance than a benefit.

Woolen-Mill Waste

Technical Editor:
We understand that most cotton mills pay a bonus on the scarcity of waste produced. That is, a bonus or premium is paid the employees if the amount of waste for a given period is under a certain standard, the bonus rate varying with the amount of waste. We would like to know if such a custom is in use in the woolen mills. (8204)

Soft waste in a woolen mill is not of extraordinary importance under usual conditions. Yarn or hard waste is of some moment and must be kept to a minimum.

The many variables involved in the woolen system would require such exhaustive study and records to establish a minimum standard of waste for a bonus system that the cost usually would offset the gain. A spinner is often paid by the pound for good bobbins only and is therefore penalized for soft or poor bobbins. Before the advent of automatic looms, the

weaver was sometimes penalized for excessive waste in his box (and the mill toilets often gave up generous gobs of yarn). Automatic loom waste is a matter of adjustment and operation and reflects on the overseer and second-hands.

Because of the many variables involved and the liability to disagreement with the help, it is not customary to penalize for excessive waste or to pay a bonus for keeping it to a minimum in woolen mills.

Creases in Hosiery

Technical Editor:
We inclose herewith a 10-thread, 42-gage, full-fashioned stocking, and shall appreciate your opinion as to the cause of the pressure marks or creases. We use the split-bath method of dyeing and finishing our hosiery with a low percentage of delustering and splash-proofing compound. Our boarding is done on an automatic boarding machine. (8198)

This trouble is often encountered in the manufacture of 10-thread hosiery and is due to "crowded" silk. The remedy is to use a machine of coarser gage or a silk of smaller size. At first glance, the defect appears to be so-called pressure marks or creases due to improper dyeing or finishing. However, we are quite certain that if you will refinish a sample with a heavier finish, you will find that the streaks will reappear when the stocking is boarded. Also, if you will dye and finish a few pairs of 4- or 5-thread hosiery with a lot of the 10-thread, we believe you will find the 4- and 5-thread samples to be free from streaks. On the other hand, if you will take one of the defective stockings, run a couple of seams up the leg, refinish, and reboard it, you will find that the creases will disappear. The seams decrease the diameter of the stocking and permit the stitches to be stretched in boarding, thus preventing crowding of the silk. These tests will enable you to prove that the knitting, and not the dyeing or finishing, is at fault.

Ring-Frame Production

Technical Editor:
With reference to the article "Ring-Frame Production" in the March issue of TEXTILE WORLD (page 94) please explain the derivation of the following production formula to me:

$$\frac{\text{Spindle speed} \times \text{Dia.} \times \Pi \times \text{Hrs.} \times 60}{\text{Twist} \times \text{Dia.} \times \Pi \times 36 \times \text{St.hk.} \times \text{No.}}$$

Also kindly explain how from that formula the constant 33.6 is derived for the following production formula:

$$\frac{\text{Spindle speed}}{\text{Twist} \times 33.6 \times \text{Count}}$$

I am primarily interested in the worsted constant, but of course your explanation will be applicable to the cotton, woolen, and typp constants as well. (8250)

The front roll delivery in inches equals spindle speed divided by twist per inch. This divided by the front-roll circumference gives the r.p.m. of the front roll. Therefore, instead of the r.p.m. shown in the first formula in the first column of the article, we use spindle speed divided by twist, and also divided by the diameter times 3.1416, which is the front-roll circumference. This gives the long formula shown near the bottom of the second column, or the first one you have quoted.

Since diameter times 3.1416 is common to both numerator and denominator, we can cross it out in both cases. This leaves us with spindle speed and hours and 60 in the numerator, and leaves us with twist and 36 and standard hank and yarn number or count in the denominator.

To derive the constant it is necessary to take out those figures which are not constant or which vary with each problem, and these include spindle speed in the numerator and twist and yarn number in the denominator.

Consequently, this leaves us with hours times 60 divided by 36 times standard hank to form the constant. In other words, in the case of worsted, in which you are interested, hours are 10 and standard hank is 560. Therefore, we have ten times 60 divided by 36 times 560. Solving this a little further gives 600 divided by 20,160. To bring this fraction down to a single figure, we divide both the numerator and denominator by 600, which leaves us with 33.6 in the denominator.

Rancidity Test

Technical Editor:
What is the Kreis test for detection of rancidity in oils, mentioned in the Questions and Answers Department of your March issue? (8239)

The Kreis test for rancidity is carried out as follows: Place 5 c.c. of the oil or melted fat to be tested and 5 c.c. of concentrated hydrochloric acid in a test tube; insert a clean, sound rubber cork; and shake vigorously for 30 sec. Add 5 c.c. of phloroglucinol solution, insert the cork, shake for 30 sec., and then allow the mixture to stand for 10 min. If a pink or red color appears in the lower acid layer, a reaction is obtained; but no attention should be paid to a pale orange, yellow, or faintly pink color. When a pink or red color is obtained, make a mixture of 1 part of the sample to be tested with 9 parts of liquid petrolatum, and another mixture of 1 part of the sample with 19 parts of petrolatum. Test as before 5-c.c. portions of each of the two mixtures and note the color. Fats and oils may be divided into four classes as follows: (1) those giving no reaction: (2) those giving a reaction when undiluted, (3) those giving a reaction in dilution of 1 to 10 but no dilution of 1 to 20, and (4) those giving a reaction in a dilution of 1 to 20.

The first class represents fats and oils which may be expected to withstand severe exposure before turning rancid. The next group represents products which have not yet become rancid in so far as odor and taste are concerned, but in which those changes that will later manifest them-

QUESTIONS AND ANSWERS

selves, such as rancidity, are already in progress. The third class represents oils in a stage of incipient rancidity. Those products are well advanced on the road to rancidity, but in most cases it is evident to the senses of smell and taste. The fourth class represents those oils which have definitely become rancid. It should be observed that some crude vegetable oils, notably cottonseed, give an intense Kreis test although free from rancidity.

The extreme sensitiveness of this test enables one to predict the appearance of rancidity long before it becomes evident to the senses.

Hosiery Is Streaky

Technical Editor:

I am inclosing two samples of women's hosiery—one made from a 175-denier low-luster rayon and the other made from 125-denier rayon. You will note the streaky appearances of these stockings.

The agency for the first yarn states that I am not boiling out the stockings properly, but in my 30 years' experience in the manufacture of hosiery, I have never seen this trouble remedied by the boil-off. I always return yarn to the manufacturer if the percentage of lubricant is too high. I am of the opinion that this fault is due to improper lubrication of the yarn or possibly to the fact that the outer side of the cone was too dry.

I shall value your opinion as to the cause of the trouble and any suggestions as to how the defect can be remedied in hosiery which are already dyed and how the defect can be avoided in the future. If there are any chemicals which can be used in the boil-off to insure even dyeing, I shall appreciate learning what they are.

I am of the opinion that practically all dull-luster rayons are imperfect and that, therefore, I am always likely to have a percentage of this trouble. I shall also appreciate your thoughts on this. (8174)

We have examined the samples of hosiery in which are apparent both so-called zebra stripes and light streaks running lengthwise of the stocking. Defects of this type are not uncommon on dull-luster hosiery. In many cases the trouble can be avoided by proper scouring and dyeing of the goods; in others, the yarn is apparently at fault, and it is difficult or impossible to avoid the streaks or to remedy them entirely when they have occurred. Hosiery of this type should be scoured thoroughly before dyeing. It is essential to use soft water.

To assist in the removal of the yarn lubricant, it is advantageous to add a solvent to the scouring bath of soap or oil. Level-dyeing colors should be employed for dyeing, and glauber salt to exhaust the bath should be added only after the dyeing has proceeded at the boil for about 20 to 25 min. We are returning the samples to you. A portion of each was boiled for a few minutes with soap and ammonia and then stripped. Next, half of each stripped sample was redyed in a brown shade. You will note that the lengthwise streaks on samples Nos. 2 and 3 have disappeared. On the other hand, the zebra stripes on sample No. 1 have not

completely disappeared, but are somewhat less prominent. Our conclusions are that if these stockings had been properly scoured and dyed, part of the trouble would have been avoided, but the zebra stripes would still be evident. Apparently this latter defect is due to some condition for which the dyer is not responsible. Possibly the yarn itself is defective or, as you suggest, that the outer layers of yarn on the cone may have become dried; making it difficult or impossible to remove the winding oil during scouring or dyeing.

Thread for Seaming

Technical Editor:

Will you kindly advise me as to the size, type, process—gassed, mercerized, etc.—and put up of the cotton yarn or thread employed in the seams in the back of the legs of women's full-fashioned silk hosiery? (8226)

Different types of sewing thread are employed for different types of hosiery. For 2-thread goods of 45-gage and up, 120/3 mercerized thread twist is recommended in the needle and 100/2 in the hook; for 3-thread goods 45-gage and up, 100/3 in the needle and 80/2 in the hook; for 4-thread of any construction, 90/3 in the needle and 60/2 in the hook; for 7-thread and up, 80/3 in the needle and 60/2 in the hook.

As far as strength is concerned, the hook thread is not so important as the needle thread, and the twist should be much less in the hook thread than in the needle thread, as it is desirable for the hook thread to feld or cover the selvages or seam on the inside of the stocking. Naturally this will be done more effectively where the hook thread is soft.

Many thread mills put up sewing thread on miniature ribbon-wound cones of ¼ to ½ lb. This is the general practice with waxed-finish thread of a very high grade. Ordinarily, the higher finished sewing threads are not employed in back-seaming hosiery. Other manufacturers put up seaming and looping thread on regular size open-wound cones of from ½ to 1 lb. Since the consumption of thread on loopers and sewing machines is slow as compared to consumption on knitting machines and the thread is subjected to much handling, it is the general opinion that ribbon-wound cones for sewing threads are preferable to open-wound cones. All sewing thread for use on full fashioned hosiery should be mercerized to increase the affinity of the cotton for dyes and to facilitate the production of a union between the silk in the stocking and the thread in the seam. It is not always necessary for the hook thread to be mercerized, but for real chiffon hosiery of the 2- and 3-thread type, it is highly desirable. It is not necessary that sewing thread for this purpose is gassed, but generally speaking, most of the better quality of thread is gassed.

A FINISHED ITCH

Technical Editor:

Thank you for your reply to my inquiry on "an unfinished itch" [June, page 105].

I tried wrapping my legs in sandpaper but every one who heard me walking thought I was wearing silk skirts, due to the sound of the emery against the cloth.

Long-legged underwear would merely add insult to injury and push me into the frying pan, if you know what I mean. Or do I?

Furthermore, I have been officially advised that the sheep (plural) from which the wool was shorn (or is it sheared) has long since passed through the esophagus of some Blimey in the form of mutton, so that's out.

Further some more, I tried that hot-iron stuff before I heard from you; and the only effect it had was to raise a little sweat on my brow, while I was handling the iron.

For the future use of any of your readers who may be as afflicted as I was, I am informing you that I have had the trousers silk-lined at a cost of two (2) dollars; and now, when I itch, I can't blame the pants.

Yours soothingly,

INQUIRER 8237.

Rayon Stretched

Technical Editor:

Inclosed you will find a swatch of cloth. In looking at the width of the cloth (see red crayon) you will see bars in the filling. The filling consists of 75-denier, first quality, 3-filament, Crown-Brand rayon, 18 turns per inch. I wind this yarn on an Atwood winder, using light swift weights, and twist it on Atwood twisters, using a fiber-head steaming spool. I steam for 8 min., and let dry 10 hr. before redrawing, and redraw at slow speed. Please advise me as to the cause of the trouble with this filling. (8211).

The filling bars found are caused by tension variations in either your redrawing or on the weaver's filling winder, or both. If you are redrawing from jack pins, you are contributing to the trouble because of increased friction as the take-up spools fill and the steaming spools are depleted. This is true even at slow speeds. Unrolling supply spools on the quiller will cause the same condition. As the supply spool is depleted, the number of revolutions is increased, affecting yarn tension. We suggest that you have some of this filling quilled over-end and woven for comparative purposes. You might also redraw over-end with the same purpose in view.

THE PERSONAL PAGE

F. L. Still, elected vice-president of Southern Textile Assn.

C. W. Dall, elected president National Assn. of Rayon Weavers

L. J. Rushworth who presided at Gibsonville meeting of S.T.A.

George S. Elliott, formerly of New Holland, Ga., has succeeded **Harry M. Rhett** as treasurer and general manager of the Dallas Mfg. Co., Huntsville, Ala. Mr. Rhett remains a director of the company.

Frederick A. Churchill has resigned as vice-president and general manager of Stewart Silk Corp., Easton, Pa.

C. A. Willard has resigned as treasurer and assistant to the president of the Bay Co., Bridgeport, Conn. Mr. Willard has also resigned as a director of the Hermitage Cotton Mills, Camden, S. C., with which the Bay Co. is affiliated.

Charles T. Main, president of Charles T. Main & Co., Boston, and past president of the American Society of Mechanical Engineers, was the recipient of the honorary degree of doctor of engineering at Northeastern University on June 18.

S. A. Robinson has resigned as secretary-treasurer of Ranlo Mfg. Co., Gastonia, N. C.

William H. Bischof, R. G. Woodbury, and **Snelson Chesney** have been made vice-presidents of Textile Banking Co., Inc., New York.

John H. Workman has been elevated to vice-president of Smith, Hogg & Co., New York.

Brown Mahon has been elected secretary of Duncan Mills, Greenville, S. C., and **J. L. Whately** has been named assistant treasurer, filling the positions held by the late David Cardwell.

H. D. Adamson, connected with the Atlantic Underwear, Ltd., Moncton, N. B., for the last 25 years, was recently appointed manager of the firm. He will also act as secretary-treasurer. **J. L. Macdonald,** the manager for a quarter of a century, has retired.

George L. Anderson, of Adams & Leland, Boston, has been elected vice-president of the Boston Wool Trade Association, succeeding the late **John F. Howe.**

James Gibson has been made superintendent of the New Bedford plant of Kendall Co., succeeding **James W. Bradbury.**

Richard W. Ward has succeeded the late A. L. Lustig on the board of the Providence (R. I.) Dyeing, Bleaching & Calendering Co. His father, **Wilfred Ward,** is president of the company.

Leonard S. Little has been elected president of the United States Finishing Co., Norwich, Conn. Other officers elected include: Vice-president, **John G. Bausher;** vice-president, **Henry B. Thompson, Jr.;** secretary-treasurer, **Grant A. McClatchie;** assistant treasurer, **Conrad deFiebre;** assistant secretary, **E. S. Hackett** and **A. S. Bard.**

M. A. Bearden has been named assistant vice-president of Pomona Mfg. Co., Greensboro, N. C.

John E. Rousmaniere, for many years prominent in the cotton goods market of New York, has resigned his association with Amoskeag Mfg. Co. and opened an office at 40 Worth St.

W. J. Walton and **Caleb F. Wright** are this year both celebrating their 60th year of continuous association with Joshua L. Bailey & Co., Philadelphia. They were simultaneously employed by Mr. Bailey in 1875 and have worked side by side ever since. They are both 77 years old.

John Johnston joined Wilson & Bradbury, New York, 50 years ago as office boy. He is now in the print cloth department of that company and celebrating his golden anniversary.

D. M. Aderholt was chosen secretary-treasurer and general manager of the Henry River (N. C.) Mills, succeeding his father, D. D. Aderholt, who died recently. **H. M. Aderholt** was recently named assistant manager of the Henry River Mills.

Harold T. Marshall, manager of the dry goods department of Kendall Mills, Walpole, Mass., division of the Kendall Co. for the last five years, has been promoted to assistant sales manager in charge of all direct and mill business. **Robert E. Gregg, Jr.,** succeeds Mr. Marshall in the dry goods department.

Ben Walters, formerly with Cohn-Hall-Marx Co., New York, is now with the Southbridge (Mass.) Finishing Co. and the Sturbridge Printing Co., Fiskdale, Mass., in charge of merchandising percales and wash goods to chain stores, mail order houses and syndicates.

Edgar B. Isaacs, recently with Fuller Fabrics, Inc., is now with Arnold Sales Corp., New York.

W. A. Hewitt has been made sales representative of Waverly Piece Dye Works, New York. He was formerly on the sales staff of the Slater Co.

C. H. Huggins, Jr., formerly with U. S. Finishing Co., has joined the sales organization of W. T. Jordan, New York, representing the North Carolina Finishing Co.

J. A. McFalls has been appointed general superintendent of Mills Nos. 2 and 3, Entwistle Mfg. Co., Rockingham, N. C. He was formerly superintendent of the No. 2 plant.

H. P. Thomas has become general superintendent of the Villa Rica (Ga.) Mills. He was formerly overseer of spinning at the same plant.

Marshall C. Stone, superintendent of Arkwright Cotton Mills, Spartanburg, S. C., has resigned to become superintendent and plant manager of Pacolet Mfg. Co., New Holland, Ga.

R. C. Stuart has been made superintendent of Walker County Hosiery Mills, Lafayette, Ga., succeeding **H. S. Lovern,** who has retired.

William Deady has resigned as superintendent of dyeing at Pontiac (R. I.) Finishing Co. to accept a similar position with Joseph Bancroft & Sons Co.

Thomas Joyce has resigned as superintendent of Algonquin Printing Co., Fall River, Mass.

Fred Dost has been appointed new superintendent of Belding (Mich.) Hosiery Mills.

H. D. Belland, for the last few years superintendent of the Verdun mill of Dominion Textile Co., Ltd., Montreal, Que., has been transferred to the Montmorency branch of the company at St. Gregoire de Montmorency, Que.

C. Fred Brent has joined Forte, Dupee, Sawyer Co., Boston, and will manage the expanded waste department.

M. E. Marcusson has been appointed assistant to **Edmund S. Cruttenden,** head of the American department of Pacific Mills, New York.

Paul H. Scharschmidt, formerly dyer for Hamilton Woolen Co., has succeeded **Joseph A. Charlton** as dress goods dyer with Arlington Mills, Lawrence, Mass.

Thomas C. Armstrong has been moved to New York to take charge of the office of Monument Mills, Housatonic, Conn.

George R. Dugan, formerly with Hamilton Woolen Co., has joined William Whitman Co., New York.

L. A. Bryan has been appointed superintendent of weaving at the Dadeville plant of Alabama Mills Co. He formerly held a similar position with the Micolas Cotton Mills, of Opp, Ala.

Carl M. Moore, superintendent of the Piedmont (S. C.) Mfg. Co., has resigned.

Alex Savage, for eight years overseer carding at the Mollohon plant of Kendall Co., Newberry, S. C., has been promoted to plant manager of the mill at Colrain, Mass.

T. J. Willis, formerly night overseer of spinning at Lonsdale Co., Seneca, S. C., has accepted a position as technical assistant with Greenwood (S. C.) Cotton Mills.

J. B. Rhinehardt is now with the Winnsboro (S. C.) Mills as assistant to the overseer of spinning conducting research and test work.

T. S. Moore has been appointed superintendent of the High Point (N. C.) Yarn Mills, succeeding **J. H. McKinnon**, who resigned.

Sam Cole has become superintendent of spinning and carding at the Micolas Cotton Mills, Opp, Ala.

J. O. Bolt has assumed his new duties as superintendent of slashing, drawing-in and tying-in at the Lanette (Ala.) unit of the West Point Mfg. Co.

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Obituary

William Edgeworth Beattie, aged 75, president of Victor-Monaghan Co., until his retirement in 1923 and formerly president of Piedmont (S. C.) Mfg. Co., died at his home in Greenville, S. C., on July 8. Mr. Beattie was a former president of American Cotton Manufacturers' Association.

Col. Louis B. Goodall, aged 84, chairman of the board of Goodall Worsted Co. and of Sanford Mills, Sanford, Me., died at his home in that place on June 26. He began as paymaster in 1869 in his father's small mill in Sanford. He was important in founding his companies and in the development of Palm Beach cloth.

George E. Kunhardt, aged 73, president of George E. Kunhardt Corp., Lawrence, Mass., until his retirement in 1926, died at his home in North Andover, Mass., on June 14.

James Polk Tarwater, aged 63, president of Harriman (Tenn.) Hosiery Mills and Rockwood (Tenn.) Hosiery Mills, died June 17.

Cassius M. Bailey, aged 58, president and treasurer of Lydia Cotton Mills, Clinton, S. C., died July 5.

Daniel Ashley Jewell, president of Crystal Springs Bleachery Co., Chicamauga, Ga., died there July 2.

J. G. Wiley, aged 73, treasurer of American Thread Co., New York, died July 1 at Poland Springs, Me.

Frank P. Knowles, aged 82, former vice-president of the Crompton & Knowles Looms Works, Worcester, Mass., died at his home in Auburn, Mass., on June 13. He was retired 22 years ago, but remained a director.

Hannibal Alden, aged 69, treasurer of the Warren Woolen Co., Stafford Springs, Conn., died June 10.

John Farwell Howe, aged 37, vice-president of the Boston Wool Trade Association and a member of the firm of Cordingley & Co., Inc., Boston, died at Jamaica Plain, Mass., June 1.

W. J. Westaway, aged 62, president and general manager of W. J. Westaway Co., Ltd., textile machinery and mill supply agents, Hamilton, Ont., died suddenly while on business in Ottawa, on June 17.

Joseph Tiers, aged 82, assistant treasurer and a director of Proctor & Schwartz, Philadelphia, died June 16.

James Brownlee Hall, aged 50, identified with a group of textile mills at Belmont, N. C., for the last 30 years, died in a Charlotte hospital, June 17.

James W. Cox, founder and retired president of Albany (N. Y.) Felt Co., died on June 18.

Franklin W. Hobbs, Jr., aged 39, president of the Hobbs Cotton Co., New Bedford, Mass., died at a hospital in Cork, Irish Free State, on June 20, following an emergency operation for appendicitis at sea while en route to Europe on his wedding trip.

Col. William F. Eaton, aged 60, for the last 20 years general manager of Eaton Knitting Co., Ltd., Hamilton, Ont., died recently in Oakville, Ont.

Harry Cotchin, aged 84, for 33 years superintendent of Danvers Bleachery & Dye Works, Peabody, Mass., until his retirement eight years ago, died at his home in Peabody on June 17.

Hugh A. Wilson, aged 62, secretary-treasurer, Montreal Cottons, Ltd., Valleyfield, Que., died recently.

Thomas V. Moseley, aged 54, formerly treasurer of Kingston (N. C.) Cotton Mills, died May 15.

J. Clarence Watkins, aged 64, of Greensboro, N. C., president of Columbia Mfg. Co., Ramseur, N. C., and one of the originators of Hunter Mfg. & Commission Co., died April 22.

David Cardwell, aged 59, secretary and assistant treasurer of the Dunean Cotton Mills, Greenville, S. C., died recently after an illness of several weeks.

F. C. Dunn, aged 63, died recently at Kinston, N. C. Mr. Dunn served as president of the old Caswell Cotton Mills.

Ezra Gordon Cone, aged 68, agent and vice-president of the Summit Thread Co., East Hampton, Conn., died June 17 at Middlesex Hospital, Middletown. He was with the company 43 years, and agent since 1902.

W. E. BEATTIE

WE FEEL a personal loss in the passing of W. E. Beattie.

We recall a day many years ago. It was at the start of our first editorial trip in the South. One of the very first men we called on—without any introduction or advance notice—was Mr. Beattie. He immediately put aside his work and spent the better part of a day initiating a very green reporter into the southern cotton industry. He piloted us from mill to mill and went to the sort of trouble that we had previously believed was reserved for one's best customers.

That incident, we have since learned, was thoroughly typical of Mr. Beattie. It reflected the character which endeared him to so many of his fellow citizens. It explains, today, the very personal nature of their sorrow.—EDITOR.

Massachusetts Requires Pick Counters by 1941

That hardy perennial of the Massachusetts Legislature, the so-called Pick Clock Bill, was passed by both houses this year and signed by the Governor on June 21. The most important feature of the bill is that pick counters must be installed on all looms running on piece-work by Dec. 31, 1940. The act does not apply to gang looms so-called or to carpet weaving and elastic-web weaving.

There was very little opposition this year on the part of the textile industry and only one executive appeared against the bill at the hearings; it being generally admitted that pick counters are beneficial to management as well as labor and that they pay for themselves within a reasonable time. The act also states that details of the character of work to be done in various departments and rates of compensation be posted.

Philadelphia Trade Holds Annual Outing

Convinced that business was on the upturn, more than 100 members of the Philadelphia Textile Association made merry on June 26 at their annual outing held at Torresdale Country Club. Col. Millard D. Brown, president of Continental Mills, is president of the association. The golf cup trophy was won by C. B. Rapp, of Aberfoyle Co., on a low net of 66. Two players tied on 67 for second place, Marshall V. Moss, president of No-Mend Hosiery, Inc., winning on a toss-up.

Credit Men Convene

The relation of the credit man to the post-NRA problems now faced by industry was a major topic at the 40th annual convention of the National Association of Credit Men, held through the week of June 17.

Textile Calendar

American Association of Textile Chemists, annual meeting, Chattanooga, Tenn., Dec. 6 and 7, 1935.

Fifteenth Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 2-7, 1935.

Textiles Shown at A.H.E.A. Meeting

A wide range of leading textile companies were represented among exhibitors at the 28th annual meeting of the American Home Economics Association, which was held the last week of June at Palmer House, Chicago. Exhibitors included International Silk Guild, American Bemberg Corp., Celanese Corp., North American Rayon Corp., and Chatham Mfg. Co

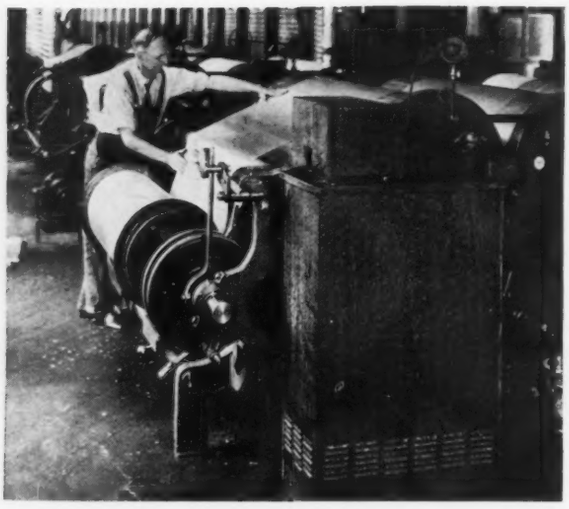
Columbia Course Reduced

Columbia University, New York, N. Y., announces that effective Sept. 1 the registration fee for all textile courses of the evening extension division has been reduced from $7 to $5. Registration for these courses has increased steadily since 1932.

Plan Three-Ply Fashion Show

Fall novelty weaves will be stressed in three fashion shows to be held July 30, Aug. 1 and 6, at the Hotel Stevens, Chicago, under auspices of the Style Creators of the Chicago Wholesale Market District.

NEW MACHINERY



Warp Conditioning Unit

Development of a conditioning unit for sized rayon warps has been announced recently by Charles B. Johnson, Paterson, N. J. The new unit, which can be applied to any Johnson rayon sizing machine now in use, is designed to deliver the warp in a properly cooled and conditioned state, soft and flexible, and free from any brittleness of the size coating which might be caused by application of heat. In addition to the improvement which it makes in the weaving qualities of the yarn, the conditioner permits an increase in the speed and production of the sizer. In the case of 150-denier viscose rayon, for example, a speed of 26 yd. per minute is attained. This higher speed is made possible by the fact that the last drying cylinder can be run hot, instead of cold, as formerly was recommended by leading authorities.

The conditioning unit itself is simple in design and its operating cost is low. Water contained in a tank at the side of the unit is lifted by a rotary pump and deposited in the form of droplets on a series of several hundred perforated tubes 8 in. long. The water spreads as a film over the surface of the tubes. Air is drawn into the unit at the rate of approximately 1,000 cu.ft. per minute, travels sideways and upwards through the machine in such a manner as to break up the water film and itself become saturated to the extent of 85%, or more. The moisture-laden air is then forced by blowers through a duct with an open slot at the top. The position of the air duct, which is placed just behind the last drying cylinder, can be seen in the accompanying illustration. The air leaving the conditioner through the slot blows upward against the warp. In evaporating the water, the air becomes cooled to a temperature of about 8 to 10° F lower than that at which it entered the conditioner. As this cool, moisture-laden air comes in contact with the dried warp, it immediately cools the yarn to room temperature (actually 2° F below room temperature).

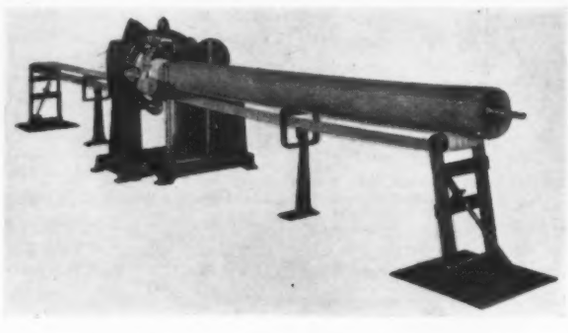
On an average, 3 gal. of water is evaporated per hour. However, the amount depends on the relative humidity of the room, and, if—as rarely happens—the air should be of exactly the right humidity, no water is drawn up by the machine, which then acts simply as a cooling device. It is emphasized by the manufacturer that, since the moisture in the air leaving the unit is in a state of molecular suspension, the conditioner does not deposit any droplets of water on the yarn, but simply subjects the warp to a draft of air at the correct humidity. Baffles in the duct insure a uniform exit of air from one end of the slot to the other. The machine is operated by a ¼-hp. motor, and all working parts are inclosed in a metallic housing.

Spiral Wrapping Machine

Terkelsen Machine Co., 326 A St., Boston, announces a new spiral wrapping machine for rolled rugs. This device, known as Model 16, is designed to construct a uniform wrap substantial enough to withstand shipping abuses. It will handle any type of wrapping material such as paper, burlap, sisal, kraft, etc.

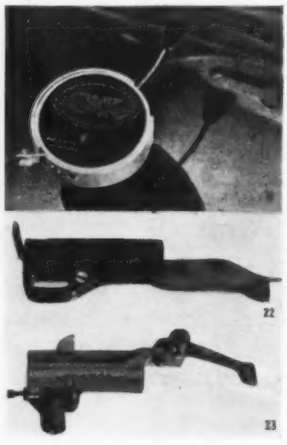
The rug to be wrapped is placed in the machine properly rolled. The ends are capped with a sheet of paper and the roll is fed through the wrapping unit by means of conveyor belts. During the process, the wrapping material is kept under a certain tension which is automatically controlled by a special compensating device. The operator manipulates the machine by means of a foot pedal, his chief duty being to adjust the machine for different diameters of rolled rugs. This adjusting is quickly and easily accomplished by unclamping, raising or lowering the adjustable yoke, and immediately reclamping it.

Mechanically, the machine consists primarily of a wrapping unit, belt conveyor and 1½ hp. motor. A feature is the tape-serving device which applies a strip of adhesive tape the entire length of the rug during the wrapping operation in order to make the overlapping spirals into a more completely homogeneous covering. An additional attachment is available for placing a rip string under the covering. Rug rolls of any length and to 12 in. diameter can be accommodated.



Feeler Motions

Three new feeler motions for looms, known as Nos. 21, 22, and 23, have been added to the regular line manufactured by Crompton & Knowles Loom Works, Worcester, Mass. No. 21 is designed for use in connection with an electric warp stop on silk, rayon, and fine cotton looms. Features include a renewable bronze bushing (with oil wick) located at main point of wear, and an electric contact through two platinum-iridium points. No. 22 is a double-purpose feeler for changing from double contact to side slip or *vice versa* on woolen, worsted, blanket, and certain cotton looms. No. 23 is a side-slip feeler designed for quick



mounting in place of No. 4 double-contact feeler; this can be accomplished without any change of stands, transfer arms, chopper, or other parts.

Greensand Zeolite

Permutit Co., 330 West 42d St., New York, recently announced a new greensand zeolite for water softening known as Super-Zeo-Dur. This material is said to be 75% more efficient than the older type, and to result in great savings in salt. Manufacturers point out that the new material is tougher and more resistant to abrasion, and that special cleaning treatments will increase greatly its water-softening capacity.

Steel-Strapping Cutter

Signode Steel Strapping Co., Chicago, has developed a tool for cutting and removing ten-

sional steel strapping with a minimum of time and effort. The cutter is made of special steel designed to cut straps up to ¾ in. wide and 0.035 in. thick. The cutting edges may be reversed, which doubles the life of the tool. A feature is the construction of the cutting jaws which are designed to pick up the strap without injury to the bale, regardless of the depth the strap may be imbedded.

Cutting Press

New Art Specialties Co., 2286 North Racine Ave., Chicago, has introduced a new cutting press to cut ribbon, tape, trimmings, labels, etc. The power model is said to handle 12,000 uniform lengths per hour and can be adjusted to cut any desired length within 0.02 in. Operation is completely automatic. Features include a locking device to insure permanency of setting, a special feed mechanism to insure uniform cutting and an easily demountable die-set in which the blades are held. The machine is 16½ in. high and 9 in. wide.

Moistening Devices

Two improved moistening devices for knitters have been introduced by Joseph Amon, Rahway, N. J. The first development—an adjustable pressed-steel bracket assembly, shown at Philadelphia—is designed to permit mounting of the splash pan at any height within a range of 8 in. The pitch of the splash pan is adjustable, and excess water is returned to the water compartment by

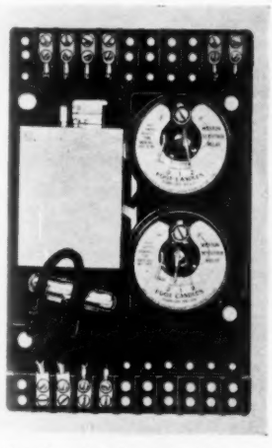
means of a copper drain. The second development is an all-metal cabinet bench of 18-gage furniture steel. All joints are spot-welded to eliminate screws, bolts, nuts, etc., and to insure smooth surfaces. The top of the bench is covered with ⅛-in. battleship linoleum and has a 3-ft. rule inset at the front

AND PROCESSES

edge. Around three sides of the cabinet are adjustable brass rods for holding press-offs and finished work. There are four compartments and two lock drawers. The humidor compartment has two solid-metal sliding doors fitted with special handles. The two water pans in the humidor are 2 in. deep and are covered with perforated grates for supporting silk cones.

Phototube Light Control

In order to eliminate the human factor of judgment as to whether or not light from windows is sufficient, Weston Electric Co., Newark, N. J., has introduced a new phototube control designed to maintain automatically a predetermined level



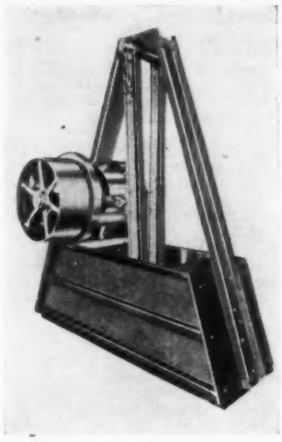
of illumination by turning off or on the regular lighting system. Desired illumination values are set on independent scales, and switches are thrown when the natural light intensity reaches these values. The mechanism is operated by means of a phototube which actuates a relay controlling the light circuit through a mercury switch. The circuit is so designed that momentary shadows do not affect the automatic control.

Hydraulic Jack

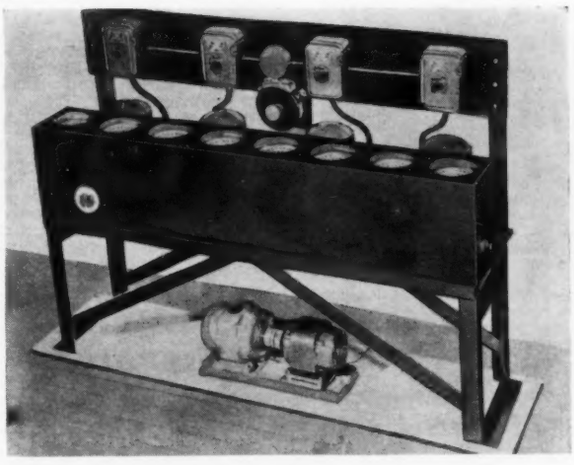
A remote-control, seven-ton, portable hydraulic ram, known as the Porto-Power jack, is announced by Black Hawk Mfg. Co., Milwaukee, Wis. Power is transferred through a six-foot flexible high-pressure hose, which offers protection to the operator by permitting him to stand well away from the work. The ram weighs only ten pounds and delivers full power in any direction. The entire mechanism is mounted on a wheeled stand for portability. In textile plants, this machine would be used for aligning machines; straightening bent or out-of-true spinning rolls, shafts, etc.; forcing out twister cylinders and other frozen parts; bending loom binders; and removing gears and pulleys.

Wet Finishing Machinery

Riggs & Lombard, Inc., Suffolk St., Lowell, Mass., has recently announced a number of additions to its line of dyeing and finishing equipment. Included in these new developments are a cloth washer, a

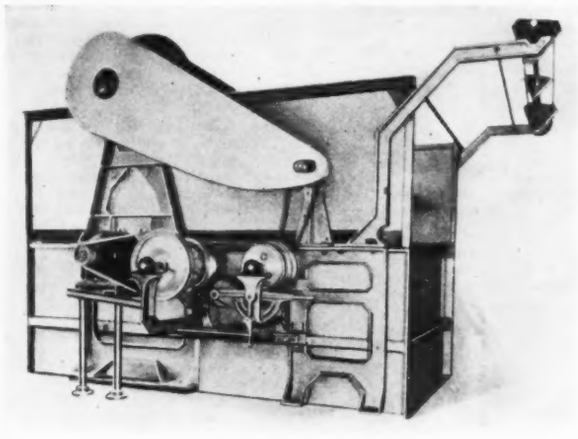


cloth carbonizing machine, a silk dye beck, and a metal piece dye kettle. The washer has several unique features and is available in sizes which will hold up to 32 pieces of medium-weight fabric; the shape of the tub and the suds-box construction are designed to effect savings in time, hot water, and soap; washer wrinkles are said to be eliminated. The carbonizing machine is constructed to provide a long contact between cloth and acid; it contains several intermediate positive-drive squeeze rolls to insure uniform soaking. The silk dye beck is designed for dyeing knitted and woven silk and rayon fabrics; the entire weight of the motor, reel, and drive is carried by outside separate cast-iron stands in order to relieve the tub of all driving strain. The all-metal stainless piece dye kettle is equipped with a tub which is independent of the rest of the machine and is free to expand in any direction; features of the machine are a five-step, V-belt, cone-pulley, variable-speed drive; new type steam pipes, and new methods of washing-off. Other new additions include an all-metal pusher mill with stainless tub; a five-speed sample kettle which will handle up to 150 lb. of woolens or worsteds; a stainless metal reel designed to give better grip on the cloth and to eliminate the "bucket effect" of the channel-shaped bars in the U-bar type; and a second reel of the combination bar-and-hump type said to be twice as effective as previous types in changing cloth folds, the angle of the hump being adjustable in several positions.



Hand-Control Starting Switch

A starting switch, designed for use where hand-operated motor control is required, is announced by General Electric Co., Schenectady, N. Y. The device, completely mounted in a compact black steel case, is provided with snap-action mechanism, and does not project as far out from the frame as the bearing housing, only the tumbler handle extending beyond the motor profile at the side. The switch is of the single-pole type, rated 6 amp. at 125 volts or 3 amp. at 250 volts, and is intended for direct mounting on the built-in terminal box of standard G.E. fractional-horsepower motors.



Single-Package Extractor

An improved single-package extractor has been announced by American Tool & Machine Co., 1415 Hyde Park Ave., Boston. The extractor, which is designed for drying yarns that have been dyed on spools or packages, is available in batteries of two machines and multiples thereof. The extraction unit consists of an extractor for a single spool, mounted on a vertical axis and driven by a motor through a V-belt. Two containers are driven by each motor. A vertical spindle is mounted in ball bearings which, in turn, are mounted in a flexible seat. A spindle extension projects upward through the center of the basket container to centralize the spool. The baskets or revolving elements are made to suit the package diameter and have perforated sides. For small spools, extra removable inner baskets are supplied.

These batteries of extractors use a novel method of dynamic braking which is said to accelerate the cycle of operation and keep maintenance and repair costs down. The braking and generator set may be mounted either directly under the battery or on the wall beside it.

It is stated that one operator can handle 16 containers on a 2-min. cycle. This includes the removal of the spools from the trays or racks and their replacement after extraction. Allowing for interruptions, the estimated output is better than 400 spools per hour for a 16-unit battery. The machines can be furnished with a definite timing control, in which case the operator has only to start the extractors and has nothing to do with stopping.

Advantages cited for the single-package extractor are as follows: no distortion of packages; no damage to paper tubes; packages may be re-dyed without rewinding; material saving in loading, spinning, and unloading time; perfect condition for unwinding yarn; normal dryness obtained; single trial packages can be extracted; any size batch can be economically handled; power cost reduced; and line surges eliminated.

Individual Motor-Drive Jig

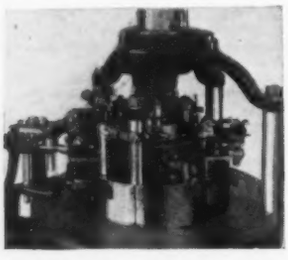
For dyeing a range of fabrics from average-weight cotton goods to sheerest rayon and silk, Textile-Finishing Machinery Co., Providence, R. I., has

NEW MACHINERY & PROCESSES

devised a new type individual-motor-drive dye jig. Features include worm-and-gear reduction units with disk-plate clutches, Monel lined tanks, and beam rolls mounted in ball bearings. Swiveling-type, single-bar contact spreaders help remove wrinkles as the fabric passes to the beam rolls.

Laying-In Attachment

Maximum flexibility of operation is stressed in the new laying-in attachment shown at the knitting show by Fidelity Machine Co., 3908 Frankford Ave., Philadelphia. Designed to operate at the full speed of any Fidelity ribber without retarding production, the device is simply constructed and easily

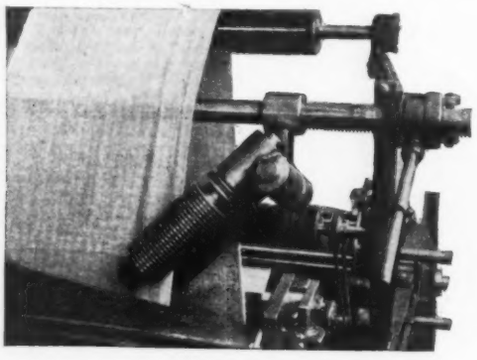


attached. Manufacturers assert that a garter of any width may be laid-in at any section of the fabric. Extra-heavy elastic yarns can be handled, and, if desired, set in alternating rows with plain yarn. No needle change, such as high or low butt, is necessary; only the cams on dial and cylinder require changing. The attachment can be used with striper actions, and with a two-feed machine of 4 in. minimum diameter.

Loop Clipper

Recently Hermas Machine Co., Hawthorne, N. J., has placed on the market a loop clipper designed to cut loops as small as ⅛ in. in length, shorter loops usually being left intact. This device at present is being used on ginghams, checks, plaids, towels, blankets, etc. It can be applied to any Hermas shear now in operation and comes as extra equipment on new machines.

Mechanically, the clipper consists of a number of hooks which catch the loops and draw them against a series of circular sharpened disks where the threads are cut. This operation is assisted by a brush on the inside which brushes the loops out from the selvage and into the paths of the hooks. Both the brush and cutting disks rotate away from the selvage in order to pull the loops outward. The clipper is designed to operate only on the selvage and at an angle of approximately 45°. It is said to be so constructed that the hooks will not catch in the cloth by mistake. Operation is entirely automatic, and no special skill or training is necessary.



Business Literature

Ribbers. Fidelity Machine Co., 3908 Frankford Ave., Philadelphia. New 52-page loose-leaf booklet devoted to line of Fidelity ribbers. In addition to a detailed description and pictures of each ribber, the booklet contains a description of auxiliary equipment, the manufacturing plant, services rendered customers, fabrics which can be produced, etc. There also is a convenient alphabetical index.

Bearings. New Departure Mfg. Co., Bristol, Conn. Tenth edition of catalog containing dimensions, load data and price list of ball bearing line.

Bearings. McGill Mfg. Co., Valparaiso, Ind. Bulletin No. 35 devoted to new line of Multirol full-type roller bearings. Also Catalog No. 13 containing data related to regular line of bearings.

Under-Grids. Davis & Furber Machine Co., North Andover, Mass. Leaflet describing under-grids or screens for woolen and worsted cards. Also folder devoted to ceiling condensers used with dusters and pickers.

Pumps. Decatur Pump Co., Decatur, Ill. Catalog No. 34 containing descriptions, illustrations, test data and curve sheets devoted to Burks pumps. Also booklet, "The Story of the Burks Pump," and price lists.

Cable Accessories. General Electric Co., Schenectady, N. Y. Illustrated 80-page book, "Cable Accessories," listing and describing all materials related to cable work. Contains data useful in making up jointing standards and other reference material.

Bearings. SKF Industries, Inc., Philadelphia. New 76-page edition of engineering data sheets for bearings. Also booklet, "Bearing on Looms."

Knitting. Wyomissing Industries (Textile Machine Works, Berkshire Knitting Mills and Narrow Fabric Co., Reading, Pa.) June issue of *The Yarn Carrier* containing article on the chain motion of the Reading full-fashioned knitting machine.

Fencing. Cyclone Fence Co., Waukegan, Ill. Booklet, "Fence," analyzing fencing needs and offering suggestions as to the best types of steel fences for industrial use. Also loose-leaf Catalog No. 107 describing several types of Cyclone fences and auxiliary equipment. Construction details, methods of fencing and other information included.

Bentonite. American Colloid Co., 363 W. Superior St., Chicago. Series of new data sheets on bentonite technology and industrial uses.

Water Coolers. Commercial Refrigeration Div., General Electric Co., Cleveland, Ohio. Illustrated catalog describing features of various types of water coolers.

Return Tubular Boilers. Combustion Engineering Co., Inc., 200 Madison Ave., N. Y. Illustrated 8-page catalog covering general specifications for a line of horizontal-return-tubular boilers, formerly known under the names of Casey-Hedges and Walsh-Weidner.

Fiber Products. Wilmington Fibre Specialty Co., Wilmington, Del. Catalog and price list devoted to standard sheets, rods, tubes, and specialties made of fiber.

New Publications

Official American Textile Directory, Textile World Publications. McGraw-Hill Publishing Co., New York; 500 pp.; $4.00.

The 1935 edition of the "Official American Textile Directory" is available. It is compact and thoroughly revised to give up-to-date details regarding all textile mills.

The Mill Section lists geographically (by states and towns) the textile mills of the United States and Canada with such information for each as names of officers and operating officials, equipment, products and sales outlets. Classification of mills by branches of industry is clearly indicated by key letters in upper right hand corner of each entry. A classified yarn-trade section gives spinners of cotton, woolen, worsted, rayon, silk, linen and jute yarns classified according to kind of yarn. A classified bleaching, dyeing, printing and finishing section lists these plants according to process and product. There is also an alphabetical section, listing all mills by company or mill name.

The size and weight or this new edition adapts it equally well to easy use in the office or the field. The price is $4.00 and a club price of $5.50 is made for the volume in conjunction with subscription to TEXTILE WORLD.

Textile Manufacturer Year Book—1935; Emmott & Co., Ltd., Manchester, Eng.; 3s. 6d.

In the latest edition of this well-known yearbook, an entirely new section on printing has been inserted, together with new articles on textile chemicals, use of latex, and processing of jute. Other new features are articles on long-drafting, cotton combing, and humidification and air conditioning. The other material included in the handbook has been revised and brought up to date.

Jute Spinning Calculations, by Andrew Smith; Pitman Publishing Corp., New York; $2.50.

In addition to calculations, this book by the head of the spinning department at Dundee Technical College, Scotland, contains brief descriptions of the preliminary operations and of those in the preparing and spinning departments. Machine details are given to make the calculations clear; and the methods, reasoning, and examples can be applied with little effort to flax spinning as well. Subjects covered include productions, drafts, doublings, speeds, twists, weights, counts, etc.

Business News

Draper Corp., Hopedale, Mass., has purchased the **Textile Machinery Corp.,** Spartanburg, S. C., successor to **Standard Looms,** for a price reported to be $300,0000. Up to the present time the Draper Corp. has made no announcement of plans concerning the new acquisition.

Bahnson Co., Winston-Salem, N. C., is constructing a three-story unit to provide an additional 1,200 sq.ft. of floor space. The building will be 80x50 ft. and a section will be used for experimental work in the manufacture of humidifiers and air-conditioning equipment.

Hamilton Machinery Co., Charlotte, N. C., established by the late Claud Hamilton, has been incorporated by Mrs. Susie Kelley Hamilton and Mrs. Roy Hamilton Clause. The company will continue in the textile machinery business, with headquarters at Charlotte.

Corn Products Sales Co. has established offices in the Hurt Building, Atlanta, Ga., in charge of C. G. Stover, who will continue to contact same trade as in the past. All business pertaining to textile and paper trade in Georgia and Alabama that Mr. Stover contacts will be handled through the Atlanta office. Corn Products Sales Co. has also established offices in the Comer Building, Birmingham, Ala., in charge of L. H. Kelley, who will continue to contact the industries he has been contacting for some time, covering the states of Tennessee, Mississippi, Louisiana, Florida, Arkansas and part of Alabama. All business pertaining to Textile and Paper trade in territory served by Mr. Kelley will be handled through this office. The Atlanta office and the Birmingham office will operate under the supervision of the Greenville, S. C. office, which is in charge of Jno. R. White.

Whitin Machine Works, Whitinsville, Mass., has made Frederick E. Banfield manager. Mr. Banfield was with the **Saco-Lowell Shops,** at Saco, Me., for 27 years.

Sholes, Inc., Orange, N. J., announces the appointment of the **Carolina Specialty Co.,** Charlotte, N. C., as exclusive agents in the South for its size mixers and dye-house equipment.

Adolff Bobbin Co., Inc., and **American Textile Engineering, Inc.,** announce the removal of their offices and factories to 681 Schuyler Ave., Kearny, N. J.

Crompton & Knowles Loom Works, Worcester, Mass., has announced that F. W. Howe, Jr., has been assigned to the company's office in Charlotte, N. C., as successor to the late S. B. Alexander, representative there for 28 years.

Tompkins Bros. Co., Syracuse, N. Y., has appointed E. W. S. Jasper, 71 Murray St., New York, as representative for the metropolitan area. Mr. Jasper is demonstrating the new Tompkins automatic shaker hockey cap machine at his offices.

Hungerford & Terry, Inc., Clayton, N. J., has elected Churchill Hungerford chairman of the board; Churchill Hungerford, Jr., president; Serano F. Alling, vice-president; Harris D. Geschwindt, secretary-treasurer.

Read Machinery Co., Inc., York, Pa., announces that M. B. Skipper has rejoined the organization and will have charge of sales in the Chicago territory.

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., has made E. D. Wacker assistant general sales manager.

Myles Salt Co., Ltd., New Orleans, La., has placed W. M. Levins in charge of its new Charlotte (N. C.) office.

TEXTILE WORLD ANALYST

Improved business expected to avert sharp adjustments

Half-Year Activity About Same as Last Year: On the basis of incomplete statistics it appears that textile mill activity for the first half of 1935 was approximately the same as that for the corresponding period of 1934, and slightly (about 7%) below an assumed "normal." This estimate is based on consumption of textile raw material. Naturally, it is for the industry as a whole and does not disclose the disparities which existed between the several branches of the industry.

JUNE 27 marked the end of the first month following the Supreme Court's NRA decision. The fact that the month had passed without any tendency toward collapse in textile markets was a most encouraging index. It showed, first, that the danger of an abrupt crisis of any large scale had been averted; and, second, that textile manufacturers had evidently learned a lot about relationship between employment conditions and corporate business progress.

By this, we do not mean that uncertainty has been removed. On the contrary, there is today no clearer indication of what method will be used to maintain industrial balance, or how successful it will be, than there was when the NRA decision was announced. However, the fact that the first shock had been weathered without any serious effects promises that future changes will not be of a violent nature, and consequently will be absorbed with less damage to the whole structure.

We now have a period which may be described as something like a race between the tendency toward gradual wage and hour revisions, and the improvement in business which would make those revisions unnecessary. Personally, we are betting on the latter. In our opinion, every indication points to continued strength in general conditions, and to a marked improvement in textiles, specifically, in the fall. We believe this improvement will extend to both volume and prices.

So far as present conditions are concerned, most of the textile markets are naturally hesitant, but with no tendency toward panic. There are one or two spots in which the outlook is not too encouraging, but on the whole the position is pretty good for this time of year. The increased volume of rayon yarn consumption and the continued high rate of activity in wool manufacture are bright spots. Curtailment program announced by cotton mills promise to preserve balance there. Hosiery and underwear markets present no serious worries.

On the price side, it will be noted from Tables I and II that manufacturing margins in carded fabrics and yarns strengthened somewhat in June, as compared with May.

A further sharp rise in raw wool marked TEXTILE WORLD's price index numbers for June. Although the top and yarn indices also advanced, they did not reflect the raw wool situation adequately, and the yarn market in particular inclined to be erratic. The wool cloth index, being based upon staple fabrics that are slow to shift, remained the same in June, although market prices for more sensitive lines were either advanced or withdrawn. All indices in the wool group are back approximately where they were last November. Until the spell was broken in May, raw wool declined continuously from a high of 153 in January, 1934, to a low of 105 in April of this year.

The cotton indices remained steady for June, with a drop of four points in the raw cotton index the most notable feature. In contrast with the long downward swing in wool prices mentioned above, raw cotton has shown no definite trend for the same period. Since January, 1934, the raw cotton index has not been lower than 124 nor higher than 141. The raw silk index seems to have difficulty in getting very far away from the 30 figure. There are occasional market spurts and sinking spells, but on a monthly basis these price changes fail to swing the index to any great extent.

TABLE I. CARDED FABRIC MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933....	21.4	December, 1934	16.2
October, 1933...	19.1	January, 1935..	16.2
January, 1934...	18.4	February, 1935..	16.0
April, 1934.....	17.6	March, 1935....	15.9
July, 1934.....	15.5	April, 1935.....	16.1
August, 1934....	16.6	May, 1935.....	16.0
September, 1934	18.6	June, 1935.....	16.5
October, 1934...	17.4	June 5.....	16.7
November 1934.	15.8	June 12.....	16.6
		June 19.....	16.4
		June 26.....	16.1

TABLE II. CARDED YARN MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933....	23.5	December, 1934.	13.5
October, 1933...	20.0	January, 1935..	13.5
January, 1934...	18.3	February, 1935..	13.9
April, 1934.....	15.9	March, 1935....	14.4
July, 1934.....	14.7	April, 1935.....	14.1
August, 1934....	15.3	May, 1935.....	13.8
September, 1934.	15.6	June, 1935.....	14.5
October, 1934...	14.6	June 5.....	14.2
November, 1934.	13.5	June 12.....	14.7
		June 19.....	14.6
		June 26.....	14.5

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Textile World's Price Index Numbers

	Cotton Index Numbers				Wool Index Numbers				Silk Index
Date	Cotton	Yarns	Gray	Colored	Wool	Tops	Yarns	Cloth	Raw Silk
July 31, 1914..	100	100	100	100	100	100	100	100	100
1932, average..	51	76	73	100	78	97	115	128	34
1933, " ..	84	116	110	113	116	135	139	181	35
Jan. 1934.....	124	151	139	144	153	180	181	222	32
Feb. 1934.....	132	148	146	144	153	180	181	222	34
Mar. 1934.....	132	149	145	142	152	178	180	209	31
Apr. 1934.....	128	144	141	141	147	176	180	209	30
May 1934.....	125	136	132	140	140	166	170	209	27
June 1934.....	132	136	132	140	138	150	169	209	26
July 1934.....	135	148	136	140	138	159	161	209	25
Aug. 1934.....	141	150	136	140	130	150	160	209	25
Sept. 1934.....	138	148	149	144	127	145	155	190	24
Oct. 1934.....	133	141	143	140	125	140	154	188	26
Nov. 1934.....	134	136	138	140	124	137	154	190	27
Dec. 1934.....	135	136	139	140	124	136	154	190	29
Jan. 1935.....	135	138	137	140	124	132	154	190	32
Feb 1935.....	134	138	136	140	116	124	152	190	31
Mar. 1935.....	127	136	134	139	108	118	148	190	29
Apr. 1935	127	135	131	138	105	114	148	190	30
May 1935.....	132	137	133	139	108	116	150	200	30
June 1935.....	128	138	133	139	123	135	155	200	30

Note: All cotton indices since Aug. 1, 1933, include processing tax.

TEXTILE WORLD'S

Cotton Digest

THE Cabinet Committee on Cotton Textiles cannot complain that the industry does not know what it wants. The recommendations submitted last month by G. H. Dorr on behalf of the Cotton Textile Industry Committee and the Cotton-Textile Institute were concise, clear and comprehensive.

The industry asks for: immediate announcement of cotton-loan base for 1935-1936 crop; payment of export tolerance; limitation of cotton textile imports; elimination of processing tax, or levying of compensatory tax on competing fibers; Government aid in search for increased outlets for cotton. The final recommendation, while less specific, "says a mouthful." The industry asks for "encouragement and support to the cotton textile industry in continuing its present efforts, and in its endeavor to develop better methods, for dealing with the problem of over-capacity."

That's not too much to ask, is it?—*Editor.*

Majority Mills Staying in Line

Since NRA went out the window a determined effort has been made by American Cotton Manufacturers Association, National Association of Cotton Manufacturers, and other groups to keep the industry in line with former NRA code provisions. The two major associations went so far as to appoint voluntary self-regulation committees to "reason" with recalcitrant mills, and to put the pressure of public opinion on them if necessary. W. M. McLaurine is chairman of the southern group, while Lincoln Baylies heads the northern committee. In each textile State, key men were appointed to investigate and report violations.

The vast majority of the manufacturers eagerly entered into this voluntary cooperative agreement and are living up to its provisions. The southern conformance committee reports that 98% of the textile plants in the South are scrupulously living up to former code regulations with reference to wages and hours. The few which have gotten out of line are small, poorly financed units located in isolated areas. At this writing, observers feel that the industry is in a stronger cooperative position than it has been since collapse of NRA.

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Let's Go Fishing —Everyone's Curtailed!

Practically every cotton mill announced last month that July operations would be greatly reduced. Curtailment periods range from week of July 4 to "indefinite." For several weeks, market prices "have not reflected the industry's cost of production," and sales of goods have been at a minimum. As long as the present uncertainty and unsound market conditions continue manufacturers assert that they will accumulate absolutely no stocks.

Donald Comer, of Birmingham, Ala., outlined what he believes is necessary for mills and operatives to get back to work. He said in part:

"I think that if competing fibers such as jute, rayon, paper and sisal could be equally burdened by taxes compensating for the processing tax on cotton; I think if the processing tax on cotton could be collected nearer the point of consumption; I think if imports of cotton goods from Japan could be controlled so as to put a stop to increased yardage coming in; I think if a fair share of the 500 million yards of export business could be reclaimed, that American mills and American textile workers could go back to work. I think if the Government loan policy of 12c. could be continued for another season, with immediately following an announcement as to what the policy should be for handling this matter following 1936, that the stabilizing of the price of cotton would help."

•

Conformance Stressed by S. C. Manufacturers

The Cotton Manufacturers Association of South Carolina, holding its annual meeting June 27 at Spartanburg, S. C., was urged by speakers to avoid any change in present wage and hour set-up. One of the prime objectives of the association, it was pointed out, should be to gain the confidence of the public and of the textile operatives in the State.

All officers were reelected as follows: S. Marshall Beattie, of Greenville, president; A. F. McKissick, of Greenville, vice-president; William P. Jacobs, of Clinton, secretary and treasurer; T. Frank Watkins, of Anderson, general counsel. The following were named members of the executive committee: J. A. Chapman, Sr., of Spartanburg; E. M. Johnston, of Greenville; L. O. Hammett, of Anderson; Capt. Elliott W. Springs, of Lancaster; Emslie Nicholson, of Union; A. E. Jury, of Winnsboro, and W. P. Hamrick, of Columbia.

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AAA vs. Constitution

Dozens of cotton manufacturing concerns have entered suits to recover millions of dollars paid the Government in the form of processing tax. In each of the suits, the Agricultural Adjustment Act is charged with being unconstitutional on many grounds. One charge is that the Secretary of Agriculture has been given improper and unlawful legislative power. The Hoosac Mills case awaits decision from the U. S. Circuit Court of Appeals.

Proponents of the AAA have introduced an amendment which would prohibit the filing of a suit if the action is for the purpose (or has the effect) of preventing the assessment or collection of the processing tax, or obtaining a declaratory judgment in favor of the tax. The amendment passed the House of Representatives and early this month was before the Senate for consideration.

Manufacturers assert that the proposed amendment is "clearly an admission of the Administration's belief in the unconstitutionality of the original act." Attorney General Homer Cummings prophesied that test cases to decide the constitutionality of AAA should reach the Supreme Court early this fall.

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Effect of Pre-Ginning Storage on Spinnability

Studies to determine what effect the storing of seed cotton for four weeks previous to ginning has on the properties of the fiber have been made by the technical laboratory of the Indian Central Cotton Committee, Matunga, Bombay. The storage has no effect on the length or weight of fiber, it was found, and does not cause a diffusing of the oil from the seed into the fiber; but in a few cases it appears to afford a stronger and more even yarn. Since no positive benefits were determined, the committee recommends that there be no unnecessary delaying of the ginning, in view of the danger of bacterial damage. Where delay is necessary, the cotton should be dry, free from excessive dirt and trash, and kept in an atmosphere neither particularly warm nor humid. If the delay exceeds a few weeks, the seed cotton should be occasionally exposed to the sun.

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Cotton Bred for Uniformity

The discarding of cotton plants which show a variation in staple length exceeding 2/64 in. from the average is the basis for a cotton-breeding program under way at the Arizona College of Agriculture, Tucson. In the opinion of E. H. Pressley, who is in charge of the work, the uniformity of staple is an important phase of cotton breeding which has been seriously neglected, and in this propagation he is placing uniformity ahead of greater length and strength. In three years of effort he has raised the length-uniformity of his experimental crops 6.61%.

May Operations

Statistics of particular interest to cotton manufacturers, showing May operations and the raw material situation were:

Spindle activity.....83.4% capacity, or 6,095,334,830 spindle hours
Cotton consumed .....469,250 bales
Cotton exported .....278,977 bales
Cotton imported ..... 10,423 bales

April operations for comparison:

Spindle activity.....85.3% capacity, or 6,057,601,513 spindle hours
Cotton consumed .....462,844 bales
Cotton exported .....323,155 bales
Cotton imported ..... 9,060 bales

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Goods Stocks Light

June was a fluctuating and uncertain month in most branches of the cotton goods market. Paradoxically enough considering that July is usually very quiet, the opening of this month brought a pick-up in demand. The new activity was most noticeable in prints; it brought a ¼c. advance in prices, but had not lasted long enough to offer any indication as to its permanence. Probably the best basis for confidence at present is in the curtailment which was being made by mills in various divisions. Stocks in customers' hands are believed to be light.

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Spot Yarns Active

Active spot buying, but a decided coolness on the part of buyers as regards futures marked the cotton yarn market during recent weeks. Few price concessions were reported; the market generally held firm, and there seemed little likelihood of any drastic price break in the immediate offing. The numerous shutdowns of yarn mills during June was a helpful influence in keeping prices steady. Spinners' representatives both in New York and Philadelphia thought that July might prove more active than usual this year.

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Cotton Industry Briefs

Industry's efforts to maintain voluntarily code wage and hour standards will succeed so long as merchants of the country generally stand firm against price-cutting, Chas. K. Everett, manager of the New Uses Section of the Cotton Textile Institute, declared in an address at the annual convention of the National Retail Dry Goods Association.

Loan to China—The R.F.C. has extended a $50,000,000 credit to China to be used in purchasing cotton and wheat. $40,000,000 will be spent for cotton.

Senator Bankhead recently prophesied that the 1935 cotton crop will command at least 13c. lb.

Memphis, Tenn., was so pleased with its Cotton Carnival and National Cotton Show that it has offered to construct a two-story permanent building for the use of the exposition in future years.

Employees of Riverside & Dan River Cotton Mills, Inc., Danville, Va., have been paid $16,205,884 in wages and salaries during last four years as compared with $455,000 paid preferred stockholders and nothing paid common stockholders, according to John M. Miller, chairman board of directors.

COTTON IN THIS ISSUE

	page
Home Knitting Fad Aids Yarn Sales	64
U. S. Domination of World Cotton Seen at End	72
Man in Mill Vital Factor in Conformance	74
When to Stop Testing—Graphs Show Point	80
D-13 Reports on Cotton Fiber Tests	83
Cotton Maturity Readily Determined by Microscope	89
Cotton Mill Business Like Fishing, S.T.A. Told	97
Ring Frame Production	98
Thread for Seaming	99
Loop Clipper	104

Cotton Mill News

Raybestos-Manhattan, Inc., Bridgeport, Conn., has begun superstructure for new one-story addition to mill in Stratford district, for which general contract recently was let to Edward Moss & Sons, Inc., Bridgeport. New unit will cost close to $40,000, with equipment.

Burton-Dixie Corp., Chicago, Ill., has taken over mill and property of Blacksburg (S. C.) Spinning Co., and will recondition and modernize for new cotton waste plant. Additional equipment will be installed. Acquisition includes tract of about 60 acres of land, including housing development for mill operatives.

Glasgow Mills, Baltimore, Md., have been acquired by John A. Griffith & Co. It will be revamped for fancy cotton weaving and opened around Aug. 1. The Woodberry Bleach & Dye Works, also operated by Griffith will occupy part of the Glasgow mill buildings.

J. W. Wood Elastic Web Co., Stoughton, Mass., has work under way for a two-story addition, 60x200 feet. The J. W. Bishop Co., Cambridge, has the general contract.

Allied Yarns Corp., converters of cotton, rayon, worsted and other yarns has moved its offices and plant to 22 West 19th St., New York, where new machinery is being added.

Cliffside (N. C.) **Mills** is installing a ventilating system in its opening rooms. Textile Machine Shop, Spartanburg, S. C., is doing the work.

J. E. Barbour-Allentown Corp., Allentown, Pa., affiliated with the Ludlow Mfg. Associates, Boston, Mass., has let general contract to the Turner Construction Co., Architect's Building, Philadelphia, Pa., for new seven-story and basement addition to local mill at Gordon and Third Sts., for which superstructure will begin at once. New unit will be 90x145 ft., estimated to cost about $200,000, with equipment. Charles T. Main, Inc., Boston, is engineer.

Collins & Aikman Corp., Philadelphia, Pa., has awarded general contract to the Turner Construction Co., Architect's Building, for new one-story addition to mill on Fifty-first St., estimated to cost over $35,000, with equipment.

Dominion Textile Co., Montreal, Que., has awarded contract for extension to its mill at St. Gregoire de Montmorency, Que., to J. L. E. Price & Co., Ltd., Montreal. The building and machinery will represent an investment of $250,000. The expansion calls for erection of a new boiler house, a dyehouse, and a raw cotton warehouse. The boiler house will be 105x55 ft., one story, equipped with three Babcock-Wilcox and Goldie-McCulloch Ltd., boilers, each of 265 hp. Water filtration equipment will also be installed in the boiler house. The dyehouse will measure 200x105 ft., two stories. The storehouse will measure 66x50 ft., five stories.

Dominion Textiles, Ltd., is starting two additions to its plant on Main St., Magog, Quebec. Cost will be about $90,000.

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Cotton Financial Notes

Opelika (Ala.) **Cotton Mill,** operating in receivership, was offered for sale. Bids were rejected.

Ashland Corp., Jewett City, Conn., disposed of all its local property not used for manufacturing or merchandising purposes at public auction June 15. A total of 84 pieces of property, including houses and building lots, were sold by Samuel T. Freeman & Co., auctioneers. Prices were reported to have been generally good.

Lawton Mills Corp., Plainfield Conn., has sold 19 two-family houses to Alexander W. Dougherty, a local business man.

Sea Island Thread Mfg. Co., New York, has filed petition for reorganization under Section 77B. The company's plant at Whitestone, L. I., has been closed.

Odell Yarn Mill, Stony Point, N. C., has been transferred to the Killingly Worsted Mills, Co., Danielson, Conn.

Waldensian Weavers, Valdese, N. C., in receivership will be sold and not operated by the receiver. Plant closed down on May 29.

Chesnee (S. C.) **Mills** has filed a reorganization petition under Section 77B. J. D. Law has been appointed temporary trustee. Assets are placed at $1,304,822 and liabilities at $662,638.

Lydia Cotton Mills, Clinton, S. C., has filed a petition in the United States District Court, for permission to reorganize under new section of the Federal Bankruptcy Act.

Humboldt (Tenn.) **Cotton Mill** building has been sold to Milan (Tenn.) Compress Co., and its associated interest Federal Cotton Compress Co. Ralph Jones will probably continue the manufacture of mop yarns in a part of the building and the machinery otherwise will be moved.

Hillsboro (Tex.) **Cotton Mills** recently reduced its capital stock from $300,000 to $200,000.

Emporia (Va.) **Textile Mills, Inc.,** has incorporated in Virginia with authorized maximum capital of $50,000. J. T. Harris, of Emporia, is president of the new corporation.

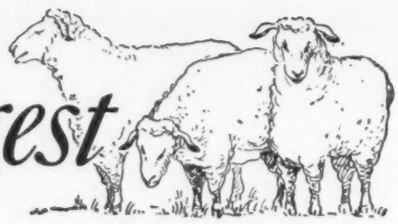
Canadian Cotton Ltd., Montreal, Que., showed an operating profit of $150,287, for fiscal year ended March 31, 1935 as compared with $76,408 in the preceding year.

Blacksburg (S. C.) **Spinning Co.,** has been sold to O. M. Burton, Chicago, who will open a cotton waste plant. About 100 people will be employed.

Texas Textile Mills, Waco, Texas, have been continued in charge of their property in 77B reorganization proceedings. The next hearing will be on Sept. 16.

TEXTILE WORLD'S

Wool Digest



THE modest piece of promotional literature prepared by the Associated Wool Industries under the title "Cool Wool," as noted elsewhere in this issue, is a step in the right direction. It is not ballyhoo, but a straight selling job on one specific type of wool product: tropical worsteds.

In fact, the versatility of wool as an all-season fiber is one of the characteristics which should be featured most strongly. Many consumers still have no idea of the marked improvement made in light-weight wool fabrics during recent years. The Golden-Fleece Pageants, held under the Wool Institute régime, first aroused popular interest in the sheer creations of wool. But this interest has been permitted to lag during the intervening years. It is our hunch that the average consumer is not aware of the progress made in this direction.

The new promotional organization must tell the world about it.—*Editor.*

Wool Industry Offers Plan to Carry on Code Work

As we go to press a ballot by mail is being taken in the wool textile industry to decide the adoption of "Rules of Business Procedure" and standard contracts for each of five industry-divisions, promulgated by the Code Authority and the N.A.W.M. directors. The "Rules" are designed to carry on the principles set forth in the code; the contract forms include not only a simplified version of those used under NRA but also state such provisions of the former merchandising rules as it is proposed to retain. This plan for self-government will be effective on ratification by 75% of the machinery of the industry. As the directors of the National Association of Wool Manufacturers, who themselves represent over 50% of the machinery, have approved the new Rules, the probability is that they will soon become effective. On ratification the Rules will be submitted to the Federal Trade Commission for approval.

The Rules of Business Procedure retain the minimum wages ($14 north; $13 south), the 40-hour week and the prohibition of employment of minors under 16 years of age, as set in the original code. In place of restriction on number of shifts is a prohibition against employment of women in any department between midnight and 6 a.m. Restrictions in these rules are thus based on social grounds rather than on artificial economic grounds. The section covering the 7A labor relations of the old NIRA has been omitted because the framers of the new rules believe that these matters are fully covered in the Wagner Labor Bill.

The Rules are to be administered by the "Business Conduct Committee" composed of six members elected by letter ballot each February. Until such election the former Code Authority will act as the Business Conduct Committee.

The reporting of prices for goods or services and the filing of copies of contracts have been discontinued, but the following statistical reports will continue to be collected by the National Association of Wool Manufacturers which is appointed official statistical agent under the Rules: employment, payrolls, man hours, etc.; machine activity; wool consumption; wool and top stocks; orders, production and shipments of woven fabrics; unfilled orders and stocks of woven fabrics.

Copies of the rules and contract forms have been distributed to the industry by Arthur Besse, president of the National Association of Wool Manufacturers.

•

U. T. W. Winds Up And Throws—What?

The United Textile Workers undoubtedly caused the strike at the Uxbridge Worsted Co., Uxbridge, Mass., which started June 24 and affected the six other plants of the company in New England, but, in baseball parlance, whether the union pitched a strike or a ball is yet to be determined. Consider the background:

First, the U.T.W. starts with a demand for a flat 20% increase in pay for all woolen and worsted workers; next, a strike is called at the plants of Uxbridge Worsted, with the union demanding a decrease in work assignments, increase of wages in certain departments, and the elimination of the third shift; and then, the union comes out on June 30 and says that what it is really after throughout the industry is the establishment of minimum wages for the various departments in the mill. The U.T.W. tries to say that the Uxbridge strike is a private affair, so that, if lost, it will not hinder the union's industry-wide program; but it must be remembered that Uxbridge is among the high-wage plants, and that real agitation for the establishment of wage minima for the various classifications was started a year ago last January.

Looking over the facts, it would seem that the U.T.W., despite any disclaimers it may make, regards the Uxbridge strike as a test case. If some set of minimum wage standards can be worked out there, the union would like to impose these standards on other mills. A certain number among worsted manufacturers would rather welcome some sort of wage standardization—since it would curb the manufacturers who chisel wages in the higher brackets—but they aren't keen on having the U.T.W. get all the glory. Some sort of voluntary agreement might be worked out, but there is fear that, if the worsted division sets rates too high, business will be lost to the woolen division (Uxbridge makes both, incidentally), where the number of small-town mills, and hence the difficulty of cooperative action, are greater. The union also wants standardization of work assignments in conjunction with wages, but in view of the report of the Works Assignment Board this seems like one of those endless wrangles.

In brief, you have a large majority of manufacturers favoring the continuation of the wages and hours provisions of the code; you have, particularly in the worsted goods division, a certain number of executives who desire some type of minimum wages for the higher-paid jobs; you have some manufacturers who want to chuck the code provisions overboard, run the hours they think best, and pay the wages they think best; you have the U.T.W., undoubtedly strong enough to cause trouble, but weakest of all in some of the smaller mills that chisel wages; and you have the union claiming to have a set of wages that it wants imposed by July 20. The answer seems to be a protracted series of demands, negotiations, and troubles.

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Carpet Wools Show Rise for Half-Year

China wools have advanced substantially from the low points of the year, as has been the case with all carpet and apparel wools. China Sining, assorted, 85-15 (that is, 85% of No. 1 and 15% of 2s, 3s and colors), was selling in Boston, Jan. 5 at 10½c. and is now quoted 13½c., a rise of 30%. This wool is used entirely for carpet-making purposes.

The No. 1 balled China, which is a woolen mill proposition, was quoted at 18½c. Jan. 5 and is now steady at 23c., a rise of approximately 25%.

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Market in Lull

The wool goods market as a whole is quiet. Plans to start the spring 1936 season early have been held in abeyance due to the NRA demise and the advent of possible labor trouble. Mill books are well filled with fall orders and manufacturers are content to sit tight and await developments. If 1936 business is going to be good, as many believe, one can well wait before going out after orders; if it is not going to be so good, it is just as well not to take early orders of doubtful "deliverability."

Tropicals for 1936 will doubtless be offered before the end of the current month, but other lines will probably not be formally opened until September.

Among fabrics of current interest mention is made of friezes in both women's and men's wear as a success of the season. For the current summer, white fabrics are being used by men on a larger scale than usual. The trend is toward fancies in men's wear and spring 1936 lines will probably feature that development.

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Wool Tops Resume Strength

Wool tops by the close of June had recovered and actually surpassed their high-price mark of May. The Wool Top Exchange's spot price stood at 89½c. on June 29, against 88c. on June 21, and 85c. all the way back to May 24, when it touched 88½c., the previous high point for the year. Futures rose 2 to 3.6c. during June. The December contract touched 85c. in the last week of that month, against a high of 85½c. in May. The spread between near and distant months is narrowing, this figure shrinking from 2.5c. early in June to 0.7c. on June 28.

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Activity of Industry

Current statistics on wool consumption and mill activity follow, the activity percentage being based on single 40-hour shift, 5½ days per week.

Wool consumed:	April	May
Total clean equiv. (excluding carpet)	21,818,000	25,444,000
Carpet wool (grease)	12,560,000	10,606,000
Looms (50" wider)	91.4%	95.2%
Carpet looms	73.6%	74.1%
Combs	137.4%	143.9%
Worsted spindles	78.4%	88.2%
Woolen spindles	97.5%	106.2%

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Wool Industry Briefs

Cocheco Woolen Co., East Rochester, N. H., where a strike had been in progress since the first week in June, secured an injunction restraining the U.T.W. from interfering with or molesting employees who desired to work and opened the plant on July 8. Police officers and deputies were on hand to see that the injunction was obeyed.

Wage adjustments in five Woonsocket spinning mills were made the latter part of June. Some increases were given in various departments, and uniformity of job and pay established in all the mills. The move was the result of a series of conferences between plant executives and the Independent Textile Union.

Scheduled hearings on proposals of AAA to license dealers in wool and mohair have been postponed. These were scheduled to start in Boston July 2 and swing through a group of cities to the Pacific Coast ending Aug. 6. Postponement was due to uncertainty of Congressional action affecting the AAA status of wool and mohair.

Associated Wool Industries has given helpful publicity to bathing suit and beach fashions styled in wool as presented by Fox Movietone in their news release in the first week of July.

Botany Worsted Mills has appointed Sol Sherman exclusive manufacturer of bow ties of Botany challis. Lewis Steiger Co. will distribute the ties. Retail price is $1.00.

WOOL IN THIS ISSUE

	page
"Cool Wool" Booklet Boosts Tropical Worsteds	64
The Fabric's the Thing!—Paris Sets Novelty Keynote	65
Sound Distribution of Overhead for Accurate Costs	68
Wool—Likely to Hold Advanced Prices	73
Harshness of Crossbreds Overcome in Finishing	82
D-13 Revises Standards for Yarns	83
Woolen Mill Waste	98
Ring Frame Production	98
A Finished Itch	99
Feeler Motions	102
Spiral Wrapping Machine	102

Stokes-Brooks Worsted Co., Woonsocket, R. I., has established New York offices at 51 Madison Ave., with Robert Rosencrans in charge.

Investigation of the production, transportation and marketing of wool by a committee of three Senators appointed by the President, was the subject of a resolution submitted to the Senate June 24 by Senators Adams and Steiwer. The resolution was referred to the Committee on Agriculture and Forestry.

International Wool Federation held its annual convention in Berlin early in June. Maurice Dubrulle, president, warned of possible advance in world wool markets if and when international currency stabilization was effected. Several speakers touched on the development of staple fiber as a wool substitute.

In addressing the Men's Clothing Advisory Committee of Associated Wool Industries, William Goldman, long an important figure in men's clothing, urged a concentrated effort to build up style-consciousness on the part of men. It was also advised to foster definite seasonal style and fabric weight changes.

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Wool Financial Notes

Farr Alpaca Co., Holyoke, Mass., reported a reduction of surplus by $1,065,227 during the fiscal year ended May 31, 1935. This includes an operating loss of $655,779, a depreciation write-off of $198,160, a reserve for bad debts of $22,500, and an inventory loss in excess of reserves of $188,787. All officers and directors were re-elected at the annual meeting.

B. C. Worsted Mills, Victoria, B. C., is involved in foreclosure by the City of Victoria on all installed machinery and equipment at Victoria. The claim is based on the company's default on its $125,000 bond issue of October 1, 1928, which the city had guaranteed. The company was stated to be agreeable to the handing over of the property, which has been idle for two years.

Cotwool Mfg. Corp., Lewiston, Me., has been incorporated. This a merger of the Cowan Woolen Co., Lewiston, and the Farnsworth Co., Lisbon Center. Capital stock is listed at $3,000,000. Directors of the Cowan company, the incorporation papers read, shall be directors of the new corporation until the next annual meeting.

Seymour (Conn.) **Pile Fabrics, Inc.,** have been chartered with capital of $10,000, to operate a local mill. Sidney Hoffman, 270 Broadway, New York, N. Y., is one of the principal incorporators.

Moderation Mfg. Co. has been organized at West Buxton, Maine, for the purpose of securing someone to operate the West Buxton woolen mill idle since the bank holiday three years ago. Officers are: President, A. L. T. Cummings, Portland; clerk, Mrs. Grace R. Sands, Buxton; treasurer, Pliny A. Crockett, Hollis, and a list of directors.

Wool Mill News

Killingly Worsted Mills, Danielson, Conn., plan extensions and improvements in former plant of Adell Yarn Mills, Inc., Stony Point, N. C., recently acquired, including building modernization and installation of new equipment. Cost about $75,000.

Apple River Mills, Inc., 636 Church St., Evanston, Ill., has been organized with capital of 1000 shares of stock, no par value, to operate a local woolen mill. Company is headed by Henry E. Steele and Milton G. Manasse, Evanston.

New England Rag Conversion Corp., Holyoke, Mass., has leased a section of the former Harmony Mills plant at Cohoes, N. Y., and will employ 200 hands.

Springfield Worsted Mills, Bordentown, N. J., is in negotiation with company at New York, name temporarily withheld, which proposes to lease local mill of first noted organization on Park St., giving employment to about 150 operatives, continuing in same line of worsted yarn manufacture.

Basch & Greenfield Co., New York, which has resumed business after several years interval, has taken over the reworked wool production of two plants, one near New York, the other in Philadelphia. It is planned later to put a wool substitute on the market.

Warrensburg (N. Y.) **Woolen Mill** has been leased by Eugene Karr, of New York, and equipment is being overhauled prior to reopening.

Fidelity Felt Co., Pike St., Philadelphia, Pa., has taken title to one-story local mill at Front and Venango Sts., and will occupy for new plant.

Paragon Worsted Co., Providence, R. I., has awarded contract to E. Turgeon, Exchange Place, Providence, for a two-story addition to its plant on Westminister St., 15x45 ft., of brick mill construction.

Baron Woolen Mills, Brigham City, Utah, is erecting two new brick buildings, one for office and shipping department, the other for warehouse.

Blue Ridge Co., Glasgow, Va., plans to get carpet production under way this month. Both Wilton and Velvet rugs and carpets will be manufactured. The plant will specialize in the production of broadloom rugs and carpets. One loom capable of an 18-foot width will be installed.

TEXTILE WORLD'S

Rayon Digest

WHAT surprises us in all this talk about three-shift operation in rayon weaving is that any one should be surprised.

The manufacturer, whose reported intention to run three shifts on seasonal fabrics when and if there is sufficient business to justify it started the conversation, has been an honest and outspoken opponent of machine-hour limitations since before the code was written. He has played the game, of course, while the code was in existence, but it was natural to expect that, after the codes, he would revert to what he believes better business policy "when and if" the situation makes it advisable.

This is one of those questions on which there are very definitely two schools of thought. Personally, we don't believe in night work in an industry where it is not necessary; nor do we believe in three shifts in an over-capacitated industry. On the other hand, the manufacturer in question—and the others of his school—argue specifically that, even if machinery limitation is sound for staple fabrics, it is out of order on seasonal fabrics.

Consequently, we are not surprised that three-shift operation is threatened in certain parts of the rayon weaving field. But we hope it can be averted. We don't think the industry, in its present status, can stand it.—*Editor.*

Dall Now President of Rayon Weavers

Charles Whitney Dall, executive vice-president of the National Rayon Weavers Association, was elected president of that organization, succeeding Percival S. Howe, of Suncook Mills, at a meeting of the board of directors held June 25 in New York. Mr. Howe was elected chairman of the board. The change was made for the double purpose of relieving Mr. Howe of pressing associational details to permit him to devote more time to his private business, and also to make for more concentration of the association's affairs in the hands of Mr. Dall. It was explained that Mr. Howe will continue to act with Mr. Dall and other officers in guiding the association respecting policy. Mr. Dall, in addition to the presidency, also holds the posts of secretary and treasurer. Miss Marie F. B. Wey was named assistant to the president.

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Japan Curtails — Mostly on Paper

The supposed 20% reduction in Japanese rayon production, which the Japanese Rayon Association voted to make effective for three months beginning July 1, is really little more than a paper curtailment, it is pointed out in the latest issue of *Textile Organon*, published by the Tubize Chatillon Corp. The *Organon* emphasized that the curtailment plan provides for various exemptions and exceptions which allow so many loopholes that the true reduction will amount to only about 2½% for the year or a total of 5,000,000 lb.

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Sales Spurt Starts Price Rise Talk

The beginning of July found the rayon industry, both yarns and woven fabrics, gradually adjusting itself to the post-NRA era. Weavers were still discussing the 3-shift controversy, and buyers were somewhat hesitant regarding commitments, but this did not seem to be a major difficulty. Certainly it did not retard the sale of yarns. Producers reported healthy sales both to weavers and knitters throughout June; up to the final week June was ahead of May; advance orders for July and August also were active. The end fo June brought the inevitable gossip about a rise in yarn prices, but this seemed premature, at least. Producers themselves pointed out that since substantial business had been placed through August, no immediate advance might be expected, but they admitted that any increase in volume during the current month might mean a price rise in September. And several sales managers said they looked for an acceleration of yarn sales within the next few weeks.

Among weavers themselves, the statement that Burlington Mills, Inc., would reserve the right to go on 3-shift, if this should be found advisable, proved the chief topic in June. Toward the end of the month, the situation cleared considerably when it was pointed out that Burlington had no immediate intention of going on 3-shifts but simply wanted to establish its right to make this change if business condition warranted.

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The Month's New Use: A 15c Rayon Sponge

A market both varied and sizeable is developing in Great Britain for the new viscose rayon sponge, recently perfected by Sponcel Ltd., a subsidiary of the Viscose Development Co., Ltd., of Bromley, Kent, according to a dispatch from our London correspondent. The Sponcel firm was registered last March to buy certain rights from a French company; it has £5,000 capital. The new sponge is sold in standard sizes and qualities at prices from the equivalent of 15c. to one dollar. Home use, hospitals, and the automobile trade are the chief markets. The sponge is unaffected by soap or grit, the makers claim.

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New Drapery Yarn

A new type of slub yarn, introduced by Delaware Rayon Co., is now being shown made up in various interesting drapery fabrics. The fabrics are suitable for a wide range of upholstery and house furnishing uses. In one case it is an interesting antique slub satin, in another a horizontal ribbed material also having the slub effect. The yarn is an all-viscose filament of varying thickness and available, bright and dull, in three sizes. The fine size is for crepe filling and the medium and coarse sizes for drapery, upholstery and such heavier textures.

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Rayon Talkie a Hit

Sight and sound have been combined very effectively to tell the story of rayon in a talking picture, "Rayon" which has been produced under auspices of the North American Rayon Corp. The picture is being shown to staffs of retail stores, textile school students, educational groups and others. The film opens with a scene in a classroom where a teacher is telling her pupils the story of rayon; the scene then changes and the various procedures in the manufacture of rayon are shown, from cutting down trees, to the actual yarn manufacture; during this entire sequence of scenes the teacher's voice carries the story explaining the operations. The film has several very dramatic moments, especially one which depicts logs floating down rapids in picturesque forest country. "Rayon" had its prevue last month in New York at a luncheon at which various officials of North American Rayon Co. and others spoke.

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Bedspreads Go Modern

Embroidered rayon bedspreads, strictly modernistic in design, and quilted rayon bedspreads exploiting a stylized fan pattern are new uses for Toile de Rae corded fabric which is woven of duPont rayon. These novelties recently made their appearance on the market and are reported by duPont Style Service as having elicited a prompt consumer interest.

Rayon Tax Issue Startles Market

The rayon processing tax issue hung like the sword of Damocles over the yarn and woven fabric markets at press-time. So far as regards the yarn industry, leaders were making plans in two directions—first, to amass data which would show the injustice of the tax with a view to possible court action if it were enacted; and, second, to be prepared for its effect on market conditions.

While it could not be said that the issue had seriously interrupted sales of either yarns or fabrics, it was without question the major problem facing both branches. Producers and weavers were not sparing in their criticism of the Washington authorities for the arbitrary manner in which the matter was being handled, and the failure to give rayon proponents a chance to be heard. At present, the proposal is to amend the AAA with a provision taxing rayon yarn 125% of the 4.2c. which is cotton's base rate; this would mean a tax of 5.25c. on rayon.

The point stressed by those opposing the tax is that it would not help cotton farmers nearly as much as it would help the silk industry. They argue, too, that actually the whole project seems to forget the original premise of the act, which was to protect cotton and to impose taxes, if any, only on such merchandise as might be directly in competition with cotton. Since rayon and silk are much closer competitors than rayon and cotton, the immediate and most significant outcome of the higher rayon prices which would result would be to push rayon closer to silk, thus giving silk, an imported fiber, an increased advantage over rayon, a domestic fiber.

A novel aspect of the situation is that it has brought about a coolness between the rayon weavers and the cotton textile industry, which two had been closely allied since the advent of the NRA. Cotton textile leaders are credited with inspiring the present move. Rayon leaders say it is still too early to disclose "what they will do" if the tax is imposed, but they draw a serious picture of the problems it presents. Not the least is the issue of the floor tax; if a floor tax should be applied, as in cotton, mills, jobbers, and retailers would face a much more complicated (one might say insoluble) problem of fixing tax ratio; rayon goes into a vast range of merchandise and often retailers are wholly ignorant of the actual rayon content of articles. Then, too, students of the situation contend that, if a rayon tax is to be imposed because cotton wants a compensatory tax, why should not the rayon industry have equal right to demand a similar compensatory tax on silk?

At present market tone is seasonally quiet. Producers are selling without any protective clause which would pass the tax on to the customer, but they make clear that such is their intention; most weavers carry a protective clause in current contracts.

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Metallized Film Now in Fabrics

The new slit metallized cellulose film which some enthusiasts regard as the eventual successor to metallic yarns in fabric manufacture, now has reached the market in fabric form. This film has been made into silver and gold-toned fabrics and is being sold for both day and evening dresses and also for the manufacture of such accessories as shoes, bags and belts. It was developed through the fabrics and finishes department of the E. I. duPont de Nemours & Co.

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Foreign Flashes

Polish Rayon Profitable—The Tomaszow Artificial Silk Co., largest rayon yarn company in Poland, reports a profit for 1934 of 4,861,228 zlotys, less 460,898 for statuary reserve. (A zloty is worth about 19c.) This marks an increase over 1933. The firm has paid a dividend of 7%.

Japan's Trail of Broken Records — Whether or not current curtailment plans mean anything, Japan's rayon output in the first four months of 1935 was a succession of new high records each month. The quarter's total was 56,790,700 lb. against 40,187,000 lb. in the January-April period last year.

Viscose on the Up-and-up—Viscose yarn production increased over yarn made by other processes in Great Britain during the first quarter of 1935 as against 1934. Last year the viscose percentage was 73.7% and it rose to 74.0% this year, which represents, in poundage, 23,005,000 lb. in January-April last year against 29,785,000 in the same period this year. The gain seemed to come from acetate which declined considerably in percentage.

And Now Peat — According to the *Manchester Guardian*, the Irish Free State Industrial Research Council is experimenting with peat as a raw material for rayon.

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Rayon Industry Briefs

Who Said Clokys Were Dead?—Combinations of white acetate yarn with brightly colored wool yarn have made possible the development of some distinctively new rayon clokys resulting in a resurrection of this supposedly passé line. The new patterns are used for both street and informal wear.

Sometimes Imitation is More Than Flattery—Rayon staple enthusiasts who say we are not moving nearly fast enough in developing markets for this yarn point to Europe as an example that the U. S. should follow. They suggest that Europe's increasing consumption of spun rayon may act as a spur in the American market since it indicates that this field has real money-making possibilities.

New Process Running Full — The Gloucester, N. J., plant of the New Process Rayon, successor to the Furness Corp., is now running at capacity, Dr. Arthur Mothwurf, general manager announces; about 2,500 lb. is made daily, this being equally divided between 100 and 150 denier.

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Rayon Mill News

Celanese Corp. of America, Amcelle, Cumberland, Md., contemplates one or more new one-story mill additions, to be used for auxiliary service. Cost reported over $100,000, with equipment.

Rayon Industries Corp., New York, is in hands of A. H. Gaathrop of Wilmington, Del., and E. C. Wilson of Norfolk, Va., as temporary trustees under 77B proceedings. The firm has seven operating subsidiaries. Hearing on July 29 will decide on making trustees permanent.

Tubize Chatillon Corp., New York, N. Y., in cooperation with Klabin, Irmaos & Co., Ltd., and S. A. Fabrica Votorantim, Rio de Janeiro, Brazil, has organized a new Brazilian interest under name of Compania Nitro Chimica Brasileira, Ltd., to construct and operate a new rayon mill in vicinity of Rio de Janeiro. Equipment formerly used at Hopewell, Va., is being removed to new location and will be augmented with additional machinery. Entire project will cost close to $2,000,000.

Clifton Yarn Mills, Inc., Conshocken, Pa., recently split its throwing equipment into two parts—half going to National Weaving Co., Lowell, N. C., and half to Cleveland Cloth Mills Co., Shelby, N. C.

DuPont Rayon Co. has informed the committee of the Waynesboro, Va., council that it would oppose any move to extend the Waynesboro corporation limits to include the Waynesboro unit. As a result, the Waynesboro council has abandoned, for the time being, its efforts to secure the annexation of suburban territory.

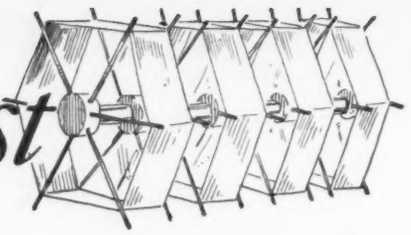
Dominion Textile Co, with head office at Montreal, Que., has completed plans for the addition of a rayon weaving unit at its branch mill in Sherbrooke, Que. The new machinery will be placed in operation early in the autumn. Between 300 and 500 additional hands will be added to the present staff of 400.

RAYON IN THIS ISSUE

	page
The Fabric's the Thing! Paris Sets Novelty Keynote	65
Germany Strives for Independence with Rayon Staple	66
Pointers for Novice in Dissecting Rayons	78
D-13 Sets Shrinkage and Wet-Strength Tests	83
Rayon Stretched	99
Feeler Motions	102
Warp Conditioning Unit	102

TEXTILE WORLD'S

Silk Digest



THE *Normandie* figured vicariously in another record which has had no publicity. The silk costumes brought over by the world's largest and fastest ship were placed on parade by the International Silk Guild in what was undoubtedly the most beautiful and most impressive fashion show ever staged for the trade.

If you don't believe it, take the word of our Silk Editor (and Silk Editors as a class are probably the most hard-boiled bunch of human beings extant). In a memo to us, he states: "The Radio City fashion show of *Normandie* styles set a trade record —and they are still talking about it. As a beautiful show, it rang the bell. I have never seen a parallel. New stunts included: Styles on models were shown in open air and wind blowing dresses gave a dramatic touch. Models were introduced by name and were social equals of the audience. There was entertainment and supper. Merely as a postscript, the supply of champagne was unlimited. Boiling it all down, it really did impress the retail trade present as few shows have done."

Now what do you think of that?

Congratulations to the Guild!—*Editor.*

Summer Fails To Wilt Silk

Raw silk underwent a few mild fluctuations during June and entered July with prices approximately 5c. below end-May levels; this was viewed as a pretty good showing, considering the normal lull of the warm months. Demand veered off considerably. Hosiery manufacturers usually begin their purchases of 13/15s for fall manufacture about this time, and even these knitters were hesitant about placing contracts. This holding-off was doubtless due to uncertainty as to how the plans for the new code system of industry government would work out.

However, silk importers felt that their market was behaving satisfactorily, all things considered. Prices were notably stable during the second half of June; indeed between June 11 and June 27 there was little more than a single cent variation on important grades.

A spurt of speculative buying lent color to the market in mid-June, but this faded promptly when importers raised prices. Actually there was little true buying by silk-consuming industries anywhere, and importers are uncertain as to just when this demand will begin to show itself.

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Silk Show de Luxe Spans U. S. By Air

Echoes of the fashion show held last month by the International Silk Guild at the International Gardens, Radio City, New York, were still being heard this month, as the fashion exhibit, which demonstrated the newest Paris silk styles, was being shown on an airplane coast-to-coast tour of the chief cities. Since the editor has stolen part of your reporter's thunder regarding that notable event at Radio City for the accompanying editorial, it remains for him to supplement with a few additional highlights. The style show comprised two-score dresses for all occasions, and featured crepes, cantons, satins, marocain, the new heavy sheers, taffeta, velvet, lace and chiffon. Black was the outstanding color, though green and pink were also accented.

The gowns were original creations from such designers as Rosevienne, Martial et Armand, Louiseboulanger, Ardanse, Chanel, Bruyere, and Piguet, and were brought to this country on the maiden voyage of the French liner Normandie. The styling, one need scarcely say, was luxurious and distinctive and assuredly did much to revive the beauty and grandeur which has always been associated with silk.

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Ribbon Group Tests New Code Plan

Intimations of what the National Federation of Textiles, Inc., is planning as regards a trade agreement for the silk industry were disclosed June 28 with the announcement that the ribbon manufacturers, a Federation affiliate, had accepted an agreement by which the chief NRA benefits would be preserved. It was made known that the Federation had developed a code of broad principles; these are to be incorporated in agreements for most divisions, if they prove satisfactory in preliminary application in the ribbon branch. The ribbon group is being used as a test because it is one of the smaller units.

The agreement provides for a 40-hour maximum work week, minimum wages, a ban on child labor, and fair trade practices; it is enforceable through liquidated damages determined by arbitration. The manufacturers representing a majority of the trade have signed or agreed to sign the contract. They bind themselves, if convicted of violations, to pay arbitration costs and damages, and failing such payment they authorize the Federation to bring civil action.

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Throwsters Favoring 4-Month Code

The commission throwing industry believes in speed when it comes to developing machinery for preservation of the NRA benefits. With the ink scarcely dry on their temporary code enactment, the throwsters started plans for a permanent 4-month agreement. This pact is an outgrowth of the preliminary one; it is contingent on approval by 80% or more of the industry and provides for a $12-13 wage minimum for a 40-hour labor week, a ban on child labor and other chief NRA provisions.

Officers of the Throwsters Research Institute were confident that the permanent plan would be adopted. It was announced June 28, one week after the agreement had been mailed out to the trade, that affirmative answers had been received from a sufficient number of firms to virtually assure success of the undertaking.

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Novelty Seen Aid To Fabric Sales

As Independence Day approached, broadsilk manufacturers were still speculating uncertainly on what the new season holds. Cutters showed increasing interest through the latter part of June, but this was confined largely to inquiry and sampling. Such early business as was placed pointed to a lively satin movement next month. There is plenty of novelty and distinction in the whole range of new broadsilks, and once the dress trade has had an intelligible reaction to its mid-summer showings, a decisive pick-up is expected. The "woolly" surfaces are important; the rough constructions of all types, including shiny and dull faces are stressed. Satins have become so varied, with the rough surfaces and trick constructions that they have a definite novelty appeal this season, and they promise to be very active soon.

The extremely heavy sheer fabrics figure prominently in current buying, and these are talked of as a coming best-seller. In metallic fabrics silver is leading over gold; color trend stresses purple in velvet and green in broadsilks.

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Cheney Modifies Line

Modification of its gray goods line, allowing for elimination of the more highly competitive constructions such as 50/64 silk flat crepes, was announced last month by Cheney Bros., through Ward Cheney, president. Mr. Cheney emphatically denied reports that the gray goods department, employing 500, would be shut down. The modification was made necessary because the firm cannot compete on the lines in question

at current prices. In an address at Manchester, Conn., home town of the company, Mr. Cheney said one of the firm's chief problems was that the mill is too large for the amount of business available under present conditions.

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Deliveries Show Normal Decline

Silk deliveries in June showed the normal seasonal decline as against May, according to figures made public this month by the Planning and Research Bureau of the National Federation of Textiles, Inc. Key figures in bales were:

	Imports	Approx. Deliveries	Stocks end of month at warehouses
May, 1935.....	37,536	38,361	36,762
June, 1935.....	38,984	33,728	42,018

World position of raw silk has improved, according to figures issued by the Commodity Exchange, New York. Production during the 1934-35 season which ended June 30, 1935, totalled 544,804 bales, a drop of 7.9% from the preceding season's total of 591,390 bales. World deliveries to mills on the other hand totaled 593,192 bales this season, a gain of 6½% over 557,240 bales in the preceding period.

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Canada's Rapid Rise

The report for the year 1933, the latest available, reveals that since the Dominion of Canada first started collecting statistics in 1917, the gross value of production of silk fabrics there has increased over 959%, capital investment over 1,358%, number of employees over 946%, the amount of salaries and wages almost 1,564%, the cost of raw and other materials over 931%, and the value added by manufacture also increased by about 975% over this period.

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News Oddities

Got Your Silk Tuxedo Yet?—That all-silk tuxedo which was introduced in Washington, D. C. recently and brought a laugh from skeptics, is proving a real dollars-and-cents proposition. Enterprising Capital haberdashers have developed a smart line of these all-silk tuxedoes, lightweight enough for a hot August night, and agreeably dull in finish, which retail at the volume price of $30. Good demand is reported.

The Pleasure is All Yours!—To two small mills employing 200 goes the doubtful honor, so 'tis reported, of having the first post-NRA broadsilk strike in the battle-scarred zone of Paterson, N. J. Workers charged that the mills in question had tried to increase hours and reduce wages; the mill officers denied this charge, explaining that lack of orders made it necessary to "stagger the work."

Those Delectable New Shades—The 56 colors presented by the Textile Color Card Association for fall silks include a notable group carrying the toothsome title of "Crushed Pastels." The Italian Renaissance influence so notable in fashion is duly recognized in several highlight shades. "Arabian Nights" is the second important group on the card.

Underwood & Underwood News Photos

Judy Fabrics, Manchester, set up this attractive exhibit at the British Industries Fair in London recently.

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Industry Briefs

Clouds Gather at Scranton—Labor leaders in the Scranton, Pa., district announced June 20 that they would do everything possible to defeat the alleged aims of several throwing silk companies there which seek to lengthen hours and lower wages. The thrown silk firms in question have formed the Weaving Yarn Commission Throwsters and it is understood the aim of this body is to eliminate the hours and wages restrictions initiated by the NRA. Other throwsters have criticized this policy as likely to harm the throwing trade as a whole.

Favor Output Control—Mills comprising the Greyco Sales Corp. group are strongly in favor of production control and hope for some development of this kind in the silk industry. Greyco mills are still obeying all the chief NRA rules and are hoping the industry as a whole will see the need for production control to effect general improvement.

Continue Code—Representatives of 85% of the upholstery and drapery fabric business, meeting in New York June 27, voted to continue operations under the hours, wages, child labor and fair trade practice provisions of the old NRA code.

New Berger Accounts—A. S. Berger, Chicago, representative of American Yarn & Processing Co., has also been appointed mid-west agent for Atwater Silk Corp., Plymouth and Wilkesbarre, Pa., and for the Riverside & Dan River Cotton Mills, Danville, Va. Mr. Berger has had over 13 years' experience in the hosiery and underwear fields.

SILK IN THIS ISSUE

	page
The Fabric's the Thing—Paris Sets Novelty Keynote	65
New Grabur Plant Shows Latest Throwing Trend...	77
Pointers for Novice in Dissecting Silks.....	78
D-13 Sets New Shrinkage Standards.....	83
Silk Fabric Pulls In.....	98
Feeler Motions	102

Silk Mill News

Economy Silk Co., Inc., Paterson, N. J., has been organized with capital of 100 shares of stock, no par value, by local interests, represented by Robert J. McDermott, 64 Hamilton St., to operate a broadsilk mill in this vicinity.

Maisel Textile Co., Inc., Paterson, N. J., has been organized with capital of 1,000 shares of stock, no par value, to operate a local silk mill. Company, represented by David Harrison, 45 Church St., Paterson, is understood to be identified with Samuel Maisel, operating a local silk mill at 158 Ward St.

Stirling (N. J.) **Broad Silk Co.** has awarded general contract to Samuel Balsamello, Bernardsville, N. J., for new one-story addition, 46x98 ft., on Essex St., estimated to cost $25,000, with equipment.

J. & B. Silk Corp., New York, has changed its name to **Rouss Silk Corp.,** following the withdrawal from the firm of Benjamin Potter.

South Boston (Va.) **Weaving Corp.,** recently organized, represented by Wirt P. Marks, Jr., Electric Building, Richmond, Va., has concluded negotiations with the South Boston (Va.) Factory Corp., for lease of land and new building, which latter will erect, at Carrington and Noblin Sts. Structure will be equipped for new silk mill, and is estimated to cost over $40,000, with machinery. Bryan & Terhune, 2 Rector St., New York, N. Y., are architects and engineers.

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Silk Financial Notes

Portland Silk Co., Middletown, Conn., will be liquidated, according to a notice of termination filed by eight principal stockholders. Plans for disposition of buildings and equipment have not been announced. Inability to meet the competition of mills in lower wage areas was cited as the cause of dissolution.

Cheney Brothers, South Manchester, Conn., is perfecting plans for reorganization under new Federal Bankruptcy Law, in accordance with permission of the District Federal Court, which has also authorized continuance of operations at the mill pending consummation of reorganization plans.

General Textile Mills, Inc., Cumberland, Md., in receivership, is being reorganized and plans early resumption of operations at local mill, closed for more than a year past.

Champlain Spinners, Inc., Whitehall, N. Y., have increased capital from $250,000 to $750,000.

Patrician Silk Co., Inc., Syracuse, N. Y., has arranged for increase in capital from $56,420 to $75,000, for general expansion.

Susquehanna Silk Mills, New York, N. Y., is concluding arrangements for company reorganization under new Federal Bankruptcy Act, and proposes early increase in operations at mills in different parts of country.

TEXTILE WORLD'S

Knit Goods Digest

THERE is romance in the statistical fact that knit underwear mills, in the *first quarter* of this year, produced 314,787 dozen polo shirts valued at $1,645,591, as against 155,745 dozen valued at $902,188 in the *full year* of 1933.

Despite the jurisdictional controversy which has waged around this item, we are confident that this remarkable increase has not meant merely a dislocation of business from one field to another. On the contrary, it has represented—to a very considerable extent—*new business*. Men and boys who have never before possessed anything of the type of a sport shirt, are now the proud possessors of one, two or more polo shirts—in addition, we are confident, to their ordinary shirt wardrobe.

What accomplished this? Styling, primarily, and promotion, secondarily.

And this job—like the French-shorts job—has been done by a branch of the industry which some observers pronounced dead several years ago.

Textile obituaries generally prove to be at least premature.—*Editor.*

Knitters Voting On New Agreements

All three knit goods branches made rapid progress through June and into July toward the enactment of trade agreements to make permanent the chief benefits of the NRA codes. While no permanent agreement had been officially enacted up to time of going to press, the outlook in that regard was very promising. Indeed, the unrest among manufacturers and their customers waned perceptibly during June due to the prospect of continued industry control.

Developments on agreements in the hosiery, underwear and outerwear branches follow:

Hosiery—Manufacturers are voting on an agreement which will become effective July 20, provided 75% of the plants representing 80% of productive capital have signed up. The contract includes the standard NRA provisions on wages, hours, and child labor. Notable points are that provision is made for continuance of statistical service and that some important fair trade practices clauses also are included. Enforcement is through the instruments of arbitration and publicity.

Underwear—Up to July 1, 87% of all underwear mills agreed to a temporary plan carrying the chief NRA provisions. As the temporary plan and the permanent contractual agreement which is now being developed are basically similar, the vote to date offers a signicant clue to what reception may be given the final proposal. The temporary plan highlights wage, hour, and child labor provisions.

Outerwear—The new trade agreement now being voted on by the outerwear mills comes more closely to exactly duplicating the NRA code than perhaps any other textile agreement. Wages, hours, child labor, label and many other provisions are included, and the agreement becomes effective when 70% have signed; trade leaders were confident that this number would sign before July 15 and that by late August 85% would have signed. The agreement runs to July 1, 1936; it gives the National Knitted Outerwear Association power to take court action against violators. Meetings at which the agreement was endorsed were held in various parts of the country, the most important being a gathering of 200 manufacturers July 1, at the Pennsylvania Hotel, New York.

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Taylor's Report Ready

The study of full-fashioned hosiery production costs conducted under guidance of Dr. George W. Taylor, of the University of Pennsylvania, has been completed. Dr. Taylor's report was submitted to the Full-Fashioned Hosiery Manufacturers of America and the American Federation of Hosiery Workers this month. The survey was made with the aim of eliminating certain inequalities in wages and also to provide a basis for the new labor contract. Joseph Haines, Jr., secretary of the association, said he expected the report to mark a new departure in such activity because of its broad nature and fundamental approach.

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50% Curtailment Aids Hosiery Tone

After three weeks of post-NRA hesitancy, hosiery sales showed considerable improvement at the end of June. Even more significant than the increased volume, according to the factors, was the increased confidence evident in all parts of the market. It was noted that hosiery buyers were less disposed to bear down on prices, and, though often enough they still deferred commitments, they were more cheerful in their outlook. Prices are steady and stocks in mills seemed to be moderate. Early announcements of new prices showed virtually no change.

This new confidence is due unquestionably to the drastic curtailment which has been voluntarily effected by mills during recent months. It is estimated that production has been cut 50% in 6 weeks.

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Mid-West Knitters Play Golf

One hundred Middle Western hosiery and underwear manufacturers were guests of the Chicago Yarn Men's Circle at its 14th annual golf tournament June 25 at Bob O' Link Golf Club, Highland Park, Ill. Low net was won by Fred Frank, Celanese Corp. of America; low gross by Dick Frost, Allen A Co.; and 25 prizes by runner-up players.

Charles E. Peffer, Cannon Mills Co., president of the Circle, was toastmaster at the banquet. "Dick" Dickson, Fred Frank and J. H. Brine were among those who supplied the talent during the entertainment. The following guests were introduced as attending the tournament for the first time: A. G. Myers, Textiles, Inc.; R. C. Thatcher, Standard-Coosa-Thatcher Co.; R. H. Johnston, Johnston Mfg. Co.; George P. Clark, Columbia Narrow Fabric Co.; J. B. Frierson, Dixie Mercerizing Co.; Fred L. Smyre, Jr., A. M. Smyre Mfg. Co.; Otto Stiegler, General Hosiery Co., and D. E. Douty, U. S. Testing Co., Inc.

Carl M. Patterson, Riverside Worsted Co., is treasurer of the Circle, and C. Walter Seidel, representing E. Gerli Co., Kahn & Feldman, Duffy Silk Co., and Columbia Narrow Fabric Co., is secretary.

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Hosiery Shipments 6% Off in April

Hosiery shipments in April 1935 were 6% below those of March, according to figures announced by the National Association of Hosiery Manufacturers. The association's bulletin points out that this is a good showing considering the worry over the NRA expiration which made April a hesitant month. Key figures by dozens issued by the association follow:

	Output	Shipments	Stocks on hand end of month
April, 1935	9,392,125	9,179,793	18,961,505
March, 1935	9,692,312	9,768,236	18,749,173

Key figures in dozens issued by the Department of Commerce for the same month:

April, 1935	7,110,087	7,382,311	14,145,893
March, 1935	7,459,215	7,741,742	14,130,618

•

Outerwear Going Up?

Outerwear sales maintained a high average through June and were still spirited during Independence Day week. Manufacturers talked blithely of a possible price advance. However, such a rise, if it developed, would be due more to increased cost of yarns than to any other factor, as wool yarn prices took a sharp jump in the fore part of June. Reorders on swimsuits held up surprisingly well.

Courtesy of Hemphill Co.

Men's stores in New York are displaying hosiery and neckwear having identical patterns, and they report that the combination encourages the purchase of two articles in place of one. The application of modern wrap-stripe attachments to hosiery machines is helping to advance the style.

—But It Was Good While It Lasted

A change is gradually manifesting itself in the consumer viewpoint of French shorts, according to sales trends of recent weeks. It was noted that most of the extreme numbers introduced in early spring have been withdrawn from the market, and that demand even for the more conservative lines has slackened. One company which is still doing a spirited and profitable business on shorts having an opening in front, regards the line as temporary. The final result of the vogue, it seems, will be to encourage brevity in styling of new lines of men's underwear.

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3 Changes in New "Berkshire Foot"

Announcement of a "three-point" change in the foot of full-fashioned stockings which may prove of far-reaching significance in the industry was made by Berkshire Knitting Mills at the end of June. The "Berkshire foot" as the development is called, has three features described as follows: (a) toe—reinforcement at the sidefront of the stocking adding strength at an important shoe-friction point; (b) arch—narrowing stitches begin an inch in front of heel, reducing strain on heel; (c) heel—uniform reinforcement gives a deeper and more cuplike shape. The new development is protected by patents and it is understood that Berkshire is developing plans by which manufacturing rights may be rented by mills.

Berkshire also has issued its fall price list containing 20 numbers and 12 colors. Prices were without significant change.

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Industry Briefs

A Bouquet for Outerwear—Alert outerwear knitters are finding that their machines are far more versatile than they had believed; as result the 1935 lines of men's bathing trunks included a striking variety of corduroy and drop stitch knits. Which suggests all kinds of possible manoeuvers for 1936.

Southern Hosiery Manufacturers Association, representing 95% of the full-fashioned and 65% of the seamless industry of the South, went on record at a meeting in Asheville, N. C., July 6 as favoring a voluntary agreement retaining the basic features of the NRA Code.

Hosiery shipments declined slightly in May, 1935, as against April, according to figures made public July 8 by the National Association of Hosiery Manufacturers. The May output was 9,124,359 doz. prs., against 9,179,793 for April. However, the January-to-May total shipment was 850,000 doz. ahead of the same period last year. May, 1935, production totaled 9,202,823 doz., about 190,000 doz. below the 9,392,125 doz. manufactured in April.

Underwear production for April, 1935, was 1,881,883 doz. and shipments 1,820,306 doz., both 200,000 larger than March, 1935. Stocks at end of April were 3,190,993 doz., a gain of 60,000.

Outerwear production for March, 1935, was 1,674,122 doz. and net shipments 1,620,812, both about 130,000 larger than February. Stocks at end of March were 3,143,482 doz., a gain of about 50,000.

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News Oddities

Put Your Own Headline on This!—An alleged bathing-suit which glows silver under a soft light but dissolves to nothing in water was displayed in Chicago recently; the "suit" was to be formally shown at the National Inventors Congress here. While declining any details as to the "garment," Congress officials said it might be used by channel swimmers.

Another Siamese Problem—Besides proving a likely money-maker, the new combined polo-shirt-and-shorts garment offers the underwear and outerwear associations a nice snarl to worry over these hot nights. Is it an underwear or an outerwear garment? And which branch may properly claim it?

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Knitting Financial Notes

Burke Hosiery Mill, Hickory, N. C. J. A. Abernathy has bought Fred A. Yoder's half-interest in the mill and thus entered into partnership with F. L. Elliott owner of the other half.

Statesville (N. C.) **Hosiery Mill** has incorporated with authorized capital stock of $50,000 and $10,000 subscribed by Fred Guerrant, Mrs. Ola C. Guerrant and F. A. Poplin.

KNIT GOODS IN THIS ISSUE

	page
3-Carrier Washboard—Its Elimination	76
Test to Avoid Hosiery Spots from Sensitive Dyes	79
Creases in Hosiery	98
Hosiery Is Streaky	99
Thread for Seaming	99
Moistening Devices	102
Laying-in Attachment	104

Knitting Mill News

Shelton (Conn.) **Knitted Sportswear** Co., incorporated May 23 for $50,000, has leased space in the Shelton Industrial Corp. building to manufacture sweaters. Morris Kimmel is president; Rose Leviton, treasurer, and A. Rudolph, secretary, all of Brooklyn, N. Y.

Belding (Mich.) **Hosiery Mills,** organized a few months ago, are placing their new local mill in operation. Harry Altbach is general manager.

Clifton Underwear Mills, Inc., Brooklyn, N. Y., are moving to the Lion Mill Bldg., St. Johnsville, N. Y.

Seneca Knitting Mills, Inc., Seneca Falls, N. Y., has awarded contracts for construction of a one-story fireproof warehouse adjoining its plant in Water St., that town.

Sherwood Knitting Mill has been organized at Cornelius, N. C., by J. H. and F. C. Sherrill.

Ridgeview Hosiery Mill Co., Newton, N. C., has completed construction of new one-story addition for increase in knitting capacity.

United Knitwear, Inc., Cincinnati, Ohio, has been chartered with a capital of $30,000. Principals of the firm are John Renner, Max M. Schiff and Walter M. Beinhart, with headquarters in the Provident Bank Bldg.

Princess Royal Hosiery Mills, Dupont, Pa., have installed an H-W conditioner for twist setting.

Infanta Sweater Mills, Philadelphia, Pa., have leased floor in building at 315-23 North Twelfth St., and will occupy for local plant.

Eureka Cotton Mills, Englewood, Tenn., closed for the last year, have been reorganized and will reopen, manufacturing men's knit underwear and employing 140 operatives.

Bryan Hosiery Mills, Inc., Chattanooga, Tenn., have work under way on extensions and improvements in building recently leased at Rossville, Ga., to be operated as a finishing mill.

Ashe Hosiery Mills, Knoxville, Tenn., have installed 100 additional knitting machines for half-hose manufacture at cost of $60,000. Additional space in the building has been leased.

Knit Rite Hosiery Corp., Princeton, W. Va., opened up late in May, after being closed for five years. W. C. Kyle, of Scottsboro, Ala., is manager.

S. Lennard & Sons Ltd., knitgoods manufacturers, Dundas, Ont., have just completed the erection of a two-story addition. The new building, which is 60 ft. square, provides 7,200 ft. floor space. The first floor will be used as a dyehouse.

TEXTILE WORLD'S

Processing Digest

THOSE who may have been discouraged at the apparent lack of progress in connection with the proposed stabilization plan for the printing division of the industry, should read the report of activities of the National Association of Finishers of Textile Fabrics (June 1934-May 1935) presented by President Albert L. Scott.

Operators of about 400 machines—out of 492—have assented to the plan in principle, he states. More than 80%! That's not a bad start.

Furthermore, he points out, it took the Swiss finishing industry nearly three years to work out a stabilization plan; the association, at the time Mr. Scott reported, had been at work on its plan less than four months!

We don't know just how the NRA demise will affect the immediate prospects for this enterprise, but at least it is heartening to learn that so large a majority of an admittedly difficult industry got together on a plan in principle.

Incidentally, in this same branch of the industry, Pacific's purchase of the 42 printing machines of American Printing Co. was another constructive development: far better than if these machines had been scattered in the form of small low-capitalized units whose competition might readily disturb the market.

—*Editor.*

Dye Production and Sales

Data released last month by the U. S. Tariff Commission show domestic production in 1934 of 87,178,000 lb. coal tar dyes, or 13.6% less than the preceding year and 7% less than the average for the period 1925-30. A corresponding decrease in the volume of sales and a slight increase in the value of sales of dyes is noted. The average unit value of sales of all dyes in 1934 was $0.51 per pound, as against $0.44 in 1933. The decrease in volume and increase in unit value of sales are due entirely to decreased sales of the low-priced tonnage dyes—indigo paste and sulphur black.

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Effect of Sunlight on Cotton Fabrics

Results of an investigation on the effect of sunlight on the strength and color of cotton fabrics reported by Texas Agricultural Experiment Station show that the length of time for which the fabrics were exposed had the greatest effect upon loss in strength and that temperature had a greater effect than relative humidity. All of the 35 fabrics tested lost strength as exposure increased, but not equally, the losses after 500 hours of exposure varying from 14 to 60% in the warp and from 21 to 76% in the filling. Heavy fabrics of coarse yarns lost less than did light fabrics of fine yarns. The loss in strength of the dyed fabrics varied with the dye or combinations of dyes used, no one shade being consistently more resistant in all fabrics, although in general blues were less weakened than other shades. Among the fabrics identical in structure the white lost more strength than did any dyed fabrics with the exception of the pink, indicating that most of these dyes afforded protection against the tendering effect of sunlight.

All white and all colored fabrics changed in color during exposure. Color changes were not dependent upon the shade, but upon the dye and depth of dyeing. Dark shades appear to fade less than light shades. Guaranteed fabrics underwent less change in color than did those not guaranteed, but "tub-fast" fabrics were not light fast. Results of this study suggest that where light fastness is desirable, it is not impossible to attain a minimum fastness, in dyed fabrics, of 100 hours of exposure to sunlight before fading is perceptible.

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Kier-Boiling Efficiency

Addition of a kier-boiling assistant of the sulphonated fatty alcohol type to the caustic soda solution ordinarily employed in kier-boiling of cotton piece goods results in the more complete removal of impurities from the fabric and indicates that the time of boiling can be reduced, it was stated in a paper delivered by F. Scholefield and D. Ward, at a recent meeting of the Society of Dyers & Colourists, of England. Experiments made by the authors disclosed that bleached cotton boiled for 7½ hours with the addition of 0.2% of the assistant on the volume of liquor used was whiter and contained a smaller amount of fats and waxes, as compared with fabrics boiled in the usual manner for the same time. It was reported further that two 2½-hour boils with the assistant gave results approximately equal to the normal 7½-hour boil.

•

Formulate Standards for Dress Goods

Standards to govern technicians in testing and rating dress fabrics in commercial testing laboratories were considered at a meeting held last month at the U. S. Bureau of Standards, Washington, D. C. The meeting had been called by the bureau; I. J. Fairchild, chief of the trade standards division, presided. New testing and rating standards were submitted by Better Fabrics Testing Bureau, Hatch & Reutlinger, and U. S. Testing Co. in cooperation with the Fabric Serviceability Committee. This committee includes representatives of the following textile branches: rayon and silk dyeing, converting, rayon weaving, laundry, and dress manufacturing.

After protracted discussion on preliminaries, the standards were considered paragraph by paragraph and various modifications made; details of the standards will be made public by the bureau shortly. D. E. Douty, president U. S. Testing Co., made a general address on the subject and analyzed the standards.

Picture, drawn by R. J. Shutting, of Chattanooga, Tenn., of Lanett Bleachery & Dye Works, West Point, Ga., showing latest additions to plant. New building in center will be used for office, shading room, and open stock; building to south of office houses bleachery and Sanforizing department; three-story building at rear holds printing equipment and additional dyeing machines. Additions total about 125,000 sq.ft. and represent an expenditure of approximately $400,000.

Sulphuric Acid in Wool

Development of an accurate and rapid method for the determination of residual sulphuric acid in carbonized wool was reported by J. Barritt, of the Wool Industries Research Assn., in recent issue of the *Journal of the Textile Institute*. The procedure is as follows:

A 2-gram sample of carbonized wool is steeped in about 100 c.c. of distilled water in a tared flask, 10 c.c. of 10% pyridine solution is added, and the contents of the flask are made up with water to a volume of between 150 and 250 c.c. The flask is closed with a glass or rubber stopper, the contents are well shaken and allowed to stand for at least one hour. The liquid is poured off, and suitable aliquots; e.g., 50 c.c., are titrated with 0.1 N. sodium hydroxide (CO_2 free), using phenolphthalein as the indicator.

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Schulze Heads Processors Guild

At a recent meeting of the board of directors of the National Textile Processors Guild, Inc., J. William Schulze was elected executive manager, succeeding Stanley R. Stager, resigned. Mr. Schulze has been connected with the organization since its inception and has served as secretary and treasurer. At the recommendation of the ways and means committee the directors voted to continue the guild as the trade association for the textile processing industry.

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Association Notes

Piedmont—The seventh annual summer outing of the Piedmont section, A.A.T.C.C., was held June 29, at Mayview Manor Hotel, Blowing Rock, N. C. Paul Haddock, of Charlotte, is chairman, and T. R. Smith, of Albemarle, secretary of this section. H. L. Derby, president of the American Cyanamid & Chemical Corp., New York, was the principal speaker on the program. The outing was followed by a dinner and dance.

New York—The annual outing of the New York section, A.A.T.C.C., was held June 28, at North Jersey Country Club, Paterson, N. J. Events included golf, tennis, luncheon, dinner and distribution of prizes. There was no technical program. Arthur Wiehl was master of ceremonies.

Rhode Island—A lively round of swimming, golf, tennis, and dinner marked the outing of the Rhode Island section of the A.A.T.C.C., held June 14, at the Warwick Country Club. Raymond A. Pingree is secretary of this section. Frank McCool was in charge of dinner plans.

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Industry Briefs

U. S. Bureau of Standards has been asked by the Textile Fabrics Association to cooperate in the establishing of a commercial standard for color fastness of curtain and drapery fabrics, the bureau has announced. It is understood that the project will cover definitions, nomenclature, methods of test, color fastness to light, washing, dry pressing, marking, and labeling.

A new process which is said to make metal fabrics strongly resistant to tarnish has been acquired by Frank Associates, New York, distributors of tinsel and metallic fabrics. Explaining that the process was developed by the Neva-Wet Corp. of America, M. J. Frank said it would prove to be an important development, as it eliminates "the greatest source of losses in claims involving tarnished metallics."

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New Dyes and Chemicals

E. I. duPont de Nemours & Co., Inc., announces the following new products: Acele Diazo Navy RD, a developed dye yielding blue shades of good general fastness on cellulose acetate; Sulfogene Red Brown 6RCF, a copper-controlled sulphur color; Ponsol Golden Orange 4G, a vat color of the cold-dyeing type giving yellowish orange shades of excellent fastness to light and weather; Sulfanthrene Black PG, a vat color specially prepared for printing and giving jet black and grade shades on cotton, rayon, silk, and acetate; and Diagen Blue MGR, producing dark, reddish blue prints of good fastness to light and washing on cotton and rayon.

General Dyestuff Corp. announces the following new products: Benzo Fast Scarlet 4BSA, a direct color giving bright bluish scarlet shades on cotton and rayon; Formyl Resist Blue G, an acid dye yielding a bright shade of royal blue and recommended particularly for production of colored discharges on silk; Supramine Bordeaux BA, an acid dye giving bright bluish red shades on wool and pure silk; Indanthren Olive GNA, a vat color giving shades of very good fastness to light and excellent fastness to washing and chemic; Cellitons Discharge Rubine 3BL, Discharge Red GGL, and Fast Red GG, three dyes for use on cellulose acetate. This company announces also Katanol SL, a new wool-resisting agent which supplements the other Katanol brands for use in union dyeing; it is also recommended in dyeing cotton-rayon and cotton-silk mixtures.

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Processing Financial Notes

Streng's Piece Dye Works, Paterson, N. J., in bankruptcy, has been sold to M. Clemens, Teaneck, N. J., for $181,500. The receiver in conference with officers of the company and creditors, had decided that liquidation of Streng's business was the most satisfactory settlement.

Delta Finishing Co., Philadelphia, Pa., has been formed under Delaware laws, with capital of 4,500 shares of stock, no par value, to operate a dye and finishing mill. New organization will take over local company of same name with plant at Lewis and Ashland Sts.

Cadgene Piece Dye Works, New Brunswick, N. J.—mill of this company, idle for some time past, has been acquired by the Parker Pure Dye Co., and will be remodeled and equipped for another line of production.

Algonquin Printing Co., Fall River, Mass., reporting as of Dec. 31, 1934, shows quick assets of $3,415,464. Liabilities reach a total of $519,000. Assets include $983,875 in Government bonds and $598,082 in municipal bonds. The capitalization of the corporation is $1,000,000.

Hartsville (S. C.) Print & Dye Works has received court permission to reorganize under Section 77B. The firm is to continue in possession of its assets.

•

Processing Plant News

Pond Lily Co., New Haven, Conn., is building an addition to its plant to be used for storage and a pump house. The addition will be one story, of brick, 23x45 feet.

Morgan Dyeing & Bleaching Co., Rochelle, Ill., has awarded general contract to Bert Nelson, Sycamore, Ill., for new one-story addition to finishing department, 60x100 ft.

Pacific Mills, Lawrence, Mass., has purchased the 42 printing machines of the American Printing Co., Fall River, Mass., together with about one-third of the remaining equipment. Sale was made through McCord, Inc., New York. This acquisition, together with the machines already located at Lawrence, Mass., and Lyman, S. C., gives Pacific nearly 20% of the total of 492 cotton printing machines reported in the industry as of 1934. The purchase takes off the market the American's machinery which, as a potential purchase by numerous small companies, had held a threat of cut-throat competition for the entire industry.

Thies Dyeing & Processing Co., Inc., Centerville, R. I., has plans nearing completion for new one-story addition, estimated to cost about $50,000, with equipment. Proposed to ask bids soon on general contract. J. E. Congdon, 26 President Ave., Providence, R. I., is architect.

Cranston (R. I.) **Print Works** has filed plans for mill alterations to cost about $10,000. Bowerman Brothers, 70 Bath St., Providence, will do the work.

PROCESSING IN THIS ISSUE

	page
Fiber-Bond Finish Increases Fabric Durability	71
Test to Avoid Spots in Hosiery from Sensitive Dyes	78
Harshness of Crossbreds Overcome in Finishing	82
Rancidity Test	98
Hosiery Is Streaky	99
Greensand Zeolite	102
Individual-Motor Jig	103
Single Package Extractor	103
Wet Finishing Machine	103

TEXTILE WORLD'S

Engineering Digest

IT must be the heat—or maybe it's the humidity.

At any rate, for quite a little while one of our staff members has been keeping up a folder of information pertaining to painting machinery, piping, etc., different colors for aiding the vision of the operator, increasing the efficiency of departments, insuring adequate cleaning of equipment, and identifying various objects and parts. The material accumulated rather rapidly—and he soon realized he had an interesting subject in hand, and one with many ramifications.

Now he wants help. He feels that many men in the engineering departments of textile mills might be able to contribute experiences and ideas for incorporation in an article on this subject. And he asks us to solicit them. We hereby do so.—*Editor.*

"Dog Days" Cut Production

Textile workers in New England (where a survey has been made) are definitely influenced by seasonal conditions, according to Dean F. W. Shumard, National School of Time Study, Norwalk, Conn. During the month of August there is a period of high temperature and humidity, known as "dog days," when the sticky weather prevents the usual output. Definite relaxation periods are favored by some manufacturers, while air conditioning or better ventilation are obvious answers to the problem.

Costs become erratic during such atmospheric conditions; and Dean Shumard suggests that the average output for a worker be established and then some method be set up whereby the excess cost is charged to suitable accounts, rather than to take it out of the operatives who work harder and produce less during bad-weather periods.

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Tennessee Electric Gets Award

Ascribe it to competition with the Government's Tennessee Valley public works development, or to individual initiative; the fact remains that the Tennessee Electric Power Co. received the annual award for 1934 of the Charles A. Coffin Foundation, established by the General Electric Co. in 1932. Early in 1934 the company placed in effect a rate reduction amounting to an immediate decrease of 15%, with an objective reduction of 28%. The total residential use of electricity increased 33.8% over the previous year, with an average increase per customer of 26.5%.

The company encouraged employees to become salesmen, explained the rate system to customers, serviced household appliances rapidly, conducted safety programs, and cooperated with the TVA and the EHFA in the sale of appliances.

•

Pace Slows in Textile Safety Work

While the textile industry still held a high rank of seventh in frequency and second in severity of accidents among a group of 30 major industries reporting to the National Safety Council, the industry has made less than average progress in frequency since 1926, while severity rates have actually increased as contrasted with sizeable decreases for all other industries. In 1934 the frequency rate of accidents in the textile industry increased 4% over the previous year, while the severity rate jumped 37%.

•

Impregnation Improves Characteristics of Wood

Pyratone Products Corp., Chicago, has brought out "Temp-Urd Wood," a union of plastics and wood. One of the disadvantages of wood is that there is a volumetric change when in contact with moisture. In most woods, even a slight change in humidity will cause a swelling or contraction. In the new process, the wood is impregnated with a synthetic resin of the phenol-formaldehyde type; thus giving hardness and a resistance to moisture changes. The wood may be given a single or a double treatment, depending on the finish required.

Experiments made thus far indicate that in the textile industry Temp-Urd Wood is particularly adapted to shuttles, bobbins, spindles, compart boards, and cones. In the case of shuttles, for example, it appears that the process not only will increase the life of the shuttle, but will permit the use of more common and less expensive woods than are now employed.

It is announced that the process has also been applied experimentally to paper cones to increase their hardness and durability, and, in adition, to prevent fraying of the yarn.

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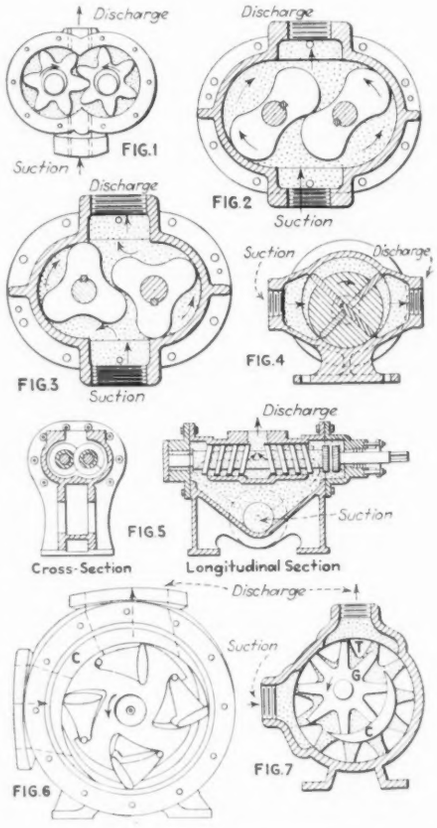
Types and Uses of Rotary Pumps

While much has been written on reciprocating and centrifugal pumps, comparatively little attention has been paid to rotary pumps, writes William E. Bakewell in *Power*. To a degree, rotary pumps combine the *constant-discharge* characteristics of the centrifugal with the *positive-discharge* characteristics of reciprocating designs. The accompanying illustration shows the most widely used types of rotaries and a little study will show the principles on which they operate.

Compared with reciprocating pumps, the rotary design delivers a continuous flow, practically free from pulsations, occupies less space, and costs less to install and maintain. Its chief disadvantage is that liquids containing grit or abrasives cannot be handled because of excessive wear.

While particularly adapted to liquids of high viscosities, rotary pumps have been widely used for other purposes, being well suited to handle liquids that might be affected by the severe agitation of centrifugal types, and where constant volume must be delivered against a varying head. Rotaries are self-prim-



TYPES OF ROTARY PUMPS—Fig. 1—Gear type. Figs. 2 and 3—Two- and three-lobed impeller types. Fig. 4—Sliding-vane type. Fig. 5—Screw type. Fig. 6—Swinging-vane type. Fig. 7—Internal-gear type.

ing and capable of operating against a suction lift of 25 ft.

Rotary pumps have, until recently, generally been considered applicable only to pressures up to 100 lb., but the author points out that models are now available for higher pressures and predicts that, in the future, pressures of 1,000 lb. or more will be successfully handled.

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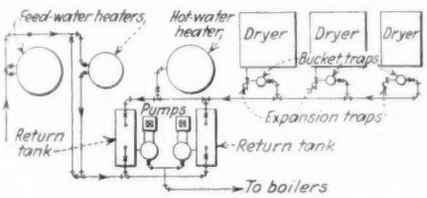
Expansion Trap Contracts Trouble

In the power plant of a finishing mill, the returns from several dryers, a water-heating system, and other equipment, were led into two closed tanks and discharged from them directly by two duplex pumps. The diagram shows the balance of the layout.

Everything worked well until one of the dryers would be taken out of service, so that it would cool and the stock could be removed. As soon as the dryer was returned to service the feed pumps would become noisy and vibrate. The trouble, according to C. W. Peters in *Power*, was caused by a flood of cold water coming into the return tanks from the dryer and creating a vacuum. The remedy was to



install an expansion trap between each dryer and its bucket trap, as shown in the diagram. When a dryer cools off its expansion trap opens to the sewer and continues to do so until the returns are up to a certain temperature.

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Adjusting Silk Spindle Belts

In many silk mills the spindles have a tendency to weave in and out and sometimes up and down. To overcome the trouble it is the practice in one plant to adjust each spindle so as to provide a 1¼-lb. pressure of each individual spindle against the belt. This adjustment is accomplished by means of a small spring scale. This practice, it will be readily seen, provides for a uniform pressure of each and every spindle against the belt.

The importance of this uniform adjustment will be realized when it is understood that all types of certain spinners are constructed with spaced guide pulleys which hold the belt against the spindles. There are four to five spindles between two guide pulleys. If, therefore, the tension of the several spindles against the belt is not uniform, it will cause the belt to deflect, which in turn causes the spindles to weave in and out. This is aggravated at the laps, where the belt is firmer in texture.

The up-and-down motion of a spindle is invariably caused by that particular spindle being out of perpendicular alignment. It is important that every spindle be adjusted exactly perpendicular, especially when using a belt having a high coefficient of friction.

Perfect tension adjustment is not so important when using a stiff belt, because such a belt is not readily deflected. Furthermore, if the belt has a low coefficient of friction, it will not cause the spindle to shift out of perpendicular and to move up and down, as does a high-friction belt. But, all in all, the high-grade, high-friction belt, is superior. The stiff, low-friction belt generally possesses such faults as the following:

1. It is liable to fail in hot weather, especially if impregnated with a filler which melts and comes out.
2. It cannot be repaired when the outer friction surface has worn off.
3. When the surface becomes oily, the slippage increases.

Many silk mills which have tried stiff, low-friction belts are enthusiastic at first regarding their performance, but they subsequently discontinue their use, for reasons as set forth above.

Unquestionably, in my mind, high-grade, high-friction, flexible belting is the best proposition for silk-spindle drive, but it is absolutely imperative that each and every spindle be adjusted to perfect alignment both vertically and horizontally, and that the tension be uniform and of the proper amount. W. F. S.

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Engineering Mill News

Blackstone (Va.) **Weaving Co.** will build a new one-story steam power house in connection with new addition to local mill, recently referred to in these columns, and is awarding all miscellaneous contracts for construction and finishing work, including reinforcing steel, structural steel, roofing, plumbing, electrical work, etc. It is proposed to have new units ready for service by the close of July. Allen J. Saville, Inc., Richmond, Va., is general contractor. Project will cost more than $50,000, with equipment.

Anchor Duck Mills, Rome, Ga., have let contract for brick school building to cost $13,929 to C. M. Guest & Sons, Anderson, S. C.

Lincoln Mills of Alabama, Huntsville, Ala. The Lincoln Union church, maintained by the Lincoln Mills for the benefit of all congregations in the village of Lincoln, was damaged to the extent of $12,500 by a fire from shorted electrical circuit. The pipe organ and furnishings were seriously damaged by smoke and water.

Peerless Woolen Mills, Rossville, Ga., have begun erection of a large brick building to be used for recreational purposes.

ENGINEERING IN THIS ISSUE

	page
Can We Afford to Make Capital Expenditures?	62
Diesel Engine as Source of Supplementary Power	84
Piping Practice—Installation and Replacement	88
Hydraulic Jack	103
Phototube Light Control	103
Hand-Control Starting-Switch	103

Some New Things And a Few Notes

International Nickel Co., Inc., has introduced K Monel, a new alloy said to possess the strength of heat-treated alloy steels and the corrosion resistance of Monel metal. The new alloy closely resembles Monel metal in composition, but aluminum has been added. One of the features is that K Monel can be hardened by heat treatment.

Timken Roller Bearing Co. has just issued the third edition of the *Timken Engineering Journal*, 260 pages, giving various types of information about roller bearings. The booklet is available without charge to qualified engineers, executives, designers, etc.

Westinghouse Electric & Mfg. Co. comes up with the information that asphalt, now an important insulating material, was just another calking material to Sir Walter Raleigh, of cloak-in-mud—hence textile—fame. Walter was pretty sick of his South American expedition in 1617 and the only break he got was that asphalt from the pitch lake at Trinidad was good calking material for the seams of his ships.

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Engineering Trade News

Combustion Engineering Co., Inc., New York, has appointed E. R. Shequine as New York district sales manager, industrial stoker division.

International Nickel Co., Inc., New York, has added Harold L. Geiger to the field staff of the development and research department.

Link-Belt Co., Chicago, has appointed **Woodward & McMillan,** Aptdo. 1691, Edificio Metropolitana, Havana, as Cuban representatives.

General Electric Co. announces the retirement of John G. Barry, senior vice-president of the company, after more than 45 years of service, and his election to an honorary vice-presidency.

Wiser Brown has been appointed plant manager for the **United States Aluminum Co.,** Fairfield, Conn., to succeed Sidney K. Becker. Mr. Brown has been in charge of sales.

Louis H. Brendel has joined the Consolidated Ashcroft Hancock Co., Bridgeport, Conn., as assistant sales manager of the Hancock Valve Division. He will assist M. S. Palmer, sales manager, in the promotion and sale of a new line of high quality valves. For the last two years Mr. Brendel has been an account executive with the Sutherland-Abbott advertising agency.

ADVERTISING PAGES REMOVED

QUOTATIONS

At close of business, July 1, 1935

Prices cover average qualities unless otherwise stated

Cotton Goods

	July 1	June 1	1934 July 2
PRINT CLOTHS			
27 -in., 64x60, 7.60	5	5	4½
38½-in., 64x60, 5.35	6	6¼	6½
39 -in., 68x72, 4.75	7	7¼	7½
39 -in., 72x76, 4.25	8¼	8¾	8¼
39 -in., 80x80, 4.00	8¾	9	8¾
BROWN SHEETINGS			
36-in., 56x60, 4.00	7¼	7¼	7½
36-in., 48x48, 5.00	5¾	5¾	5¾
37-in., 48x48, 4.00	7	7¼	7⅜
MISCELLANEOUS			
Drills, 37-in., 3 yd.	9	9	9¼
Denims, 2.20	14¼	14½	15½
Tickings, 8 oz.	17⅜	17½	18½
Standard prints	7	7	7¼

*Tax included.

Cotton Waste

Peeler comber	14.00
Peeler strip	14.25
White spooler (single)	7.50
Linters (Mill Run Average)	6.00

Cotton Prices

Spot Cotton: at:	July 1	June 1	For Month High	For Month Low	1934 July 2
New York	12.15	11.55	12.20	11.50	12.10
New Orleans	12.20	11.60	12.20	11.55	12.07
Liverpool	6.86	6.71	.....	.....	6.70

FLUCTUATIONS OF FUTURES

	Closed July 1	For Month High	For Month Low	Closed June 1	Net Change
July	11.83	11.87	11.20	11.20	+0.63
Aug	11.72	11.76	11.10	11.10	+0.62
Sept	11.61	11.65	11.01	11.01	+0.60
Oct	11.50	11.53	10.91	10.91	+0.59
Nov	11.49	11.54	10.94	10.94	+0.55
Dec	11.49	11.55	10.97	10.97	+0.52
Jan	11.50	11.56	11.02	11.02	+0.52
Feb	11.50	11.58	11.05	11.05	+0.45
Mar	11.51	11.60	11.07	11.07	+0.44

AVERAGE PRICE JUNE-JULY SHIPMENT
HARD WESTERN COTTON

	F.o.b. New England Middling	St. Middling
1⅛-in.	14.60	15.25
1 7/16-in.	16.00	16.75
1¼-in.	18.50	20.00

Based on October 11.50.

FOREIGN COTTONS

Alexandria Exchange, July 1	
July, Sak	13.83
August, Uppers	12.84
Shipment c.i.f. Boston (Tariff not included)	
Medium Sak	24.75
Medium Uppers	24.25
(By Anderson, Clayton & Co.)	
India Rough, Calcutta Camilla	10.00
China Tientsin No. 1	13.25

Quotations on cotton cloth and cotton yarn as given on this page include the cotton processing tax. Cotton waste prices also include the processing tax but of course the prices on various raw cottons do not include it.

Cotton Yarn

(Tax Added)

CARDED (Average Quality)

Double Carded 2c—4c, higher according to quality

SINGLE SKEINS OF TUBES (Warp Twist)

4s to 8s	$0.26½	20s	$0.29½
10s	.27	24s	.31½
12s	.27½	26s	.32½
16s	.28½	30s	.34½

TWO-PLY SKEINS AND TUBES

8s-2	$0.27	20s-2	$0.30
10s-2	.27½	24s-2	.32
14s-2	.28½	30s-2	.35
16s-2	.29	40s-2	.41

SINGLE WARPS

10s	$0.27½	20s	$0.30
14s	.28½	24s	.32
16s	.29	30s	.35

TWO-PLY WARPS

8s-2	$0.27½	20s-2	$0.30½
10s-2	.28	24s-2	.32½
14s-2	.29	30s-2	.35½
16s-2	.29½	40s-2 ordin.	.41½

HOSIERY CONES (Frame Spun)

8s	$0.26	18s	$0.29
10s	.26½	20s	.29½
12s	.27	22s	.30½
14s	.27½	24s	.31½
16s	.28	26s	.32½

COMBED PEELER (Average Quality)

TWO-PLY—(Knitting Twist) Cones

20s-2	$0.35½	50s-2	$0.49
30s-2	.39½	60s-2	.55
40s-2	.44	80s-2	.74

WARPS, SKEINS AND CONES

TWO-PLY—(Warp Twist)

20s-2	$0.36	50s-2	$0.50
30s-2	.40	60s-2	.56
36s-2	.43	70s-2	.66
40s-2	.45	80s-2	.76

SINGLES

14s	$0.33½	38s	$0.44
20s	.35½	40s	.45
28s	.39	50s	.49
30s	.40	60s	.55

MERCERIZED CONES—(Combed, Ungassed)

30s-2	$0.52	60s-2	$0.70
40s-2	.57	80s-2	.96

Raw Silk

Prices Nominal

	13/15 White	20/22 White	20/22 Yellow
Special Grand, 85%	1.65	1.38	1.38
Grand XX, 83%	1.55	1.35	1.35
Special Crack, 81%	1.45	1.33	1.33
Crack XX, 78%	1.40	1.31	1.31
Extra Extra, 73%	1.38	1.29	1.29
Best Extra, 68%	1.35	....	....

RAW SILK EXCHANGE

	July 1	June 1	For Month High	For Month Low	Net Change
July	1.31	1.29½	1.34½	1.29½	+0.01½
Aug	1.31½	1.29	1.33½	1.29	+0.02½
Sept	1.31½	1.29	1.33	1.29	+0.02½
Oct	1.31½	1.28½	1.33	1.28½	+0.02½
Nov	1.31½	1.28½	1.32½	1.28½	+0.02½
Dec	1.32	1.28	1.32½	1.28	+0.04
Jan	1.32	1.28	1.33	1.28	+0.04

Silk Yarns

Hosiery tram 5thd. Japan, 85%	$2.22½
Hosiery tram, 5thd. crack XX, 78%	1.97½
60/2 spun silk	2.75

RAYON WASTE

Thread (for garnetting)	$0.14–$0.15

Wool

OHIO, PENNSYLVANIA, ETC. (GREASE)

Fine delne	$0.39–$0.31	¾ blood	$0.31–$0.32
Fine clthg	.23– .25	⅝ blood	.30– .31
½ blood	.30– .31		

TEXAS AND CALIFORNIA (CLEAN)

Texas, 12 months	$0.70–$0.73
California, Northern	.60– .62

MONTANA, IDAHO, WYOMING (CLEAN)

Staple fine	$0.75–$0.77
Staple ⅞ bld	.71– .72
Fine and fine medium (original bag)	.68– .70
¾ blood	.61– .63
⅝ blood	.58– .60

EASTERN SCOURED PULLINGS

A-A	$0.75–$0.78	B-Super	$0.65–$0.70
A-Super	.71– .73	C-Super	.6– .62

CARPET WOOL (Nominal)

Aleppo (clean)	$0.24–$0.28
Sining	.13– .14
China filling (clean)	.09– .14

Tops and Noils

TOPS—BOSTON

Fine (64-66s)	$0.93–$0.95
Half-blood (60-62s)	.89– .90
Aver. ¾ blood (56s)	.78– .80
⅝ blood (50s)	.65– .70

NEW YORK TOP FUTURES

	Closed July 1	For Month High	For Month Low	Closed June 1
July	84.0	84.0	78.0	78.1
Aug	84.0	84.2	78.1	78.2
Sept	84.5	84.5	79.0	79.0
Oct	85.0	84.5	79.2	79.2
Nov	85.0	84.5	79.4	79.4

TOPS—BRADFORD ENG. July 1

Fine (64s)	30d	¾ bld. (56s)	20d
½ bld. (60s)	28d	½ bld. (50s)	16d

NOILS—BOSTON

Fine	$0.54–$0.56	¾ bld.	$0.46–$0.48
Half bld.	.50– .52	¼ bld.	.42– .43

Worsted Yarns

ENGLISH SYSTEM WEAVING

2-20s 44s	$1.00 –$1.05	2-36s 58s	$1.30 –$1.35
2-30s 46s	1.05 – 1.10	2-40s 60s	1.35 – 1.40
2-30s mixes	1.40 – 1.45	2-50s 64s	1.47½– 1.50

ENGLISH SYSTEM KNITTING

2-20s 44s	$0.90 –$0.95	2-20s 60s	$1.10 –$1.15
2-20s 50s	0.95 – 1.00	2-20s 64s	1.20 – 1.25

FRENCH SYSTEM

1-26s 64s	$1.15 –$1.20	2-40s 64s Zephyrs	$1.42½–$1.45
1-30s 64s warp	1.32½– 1.35	2-50s 66s	1.60 – 1.65

Domestic Rayon (Skeins)

VISCOSE PROCESS

Denier	Filament	Price	Denier	Filament	Price
50	14	$1.05	150	24–40	$0.55
75	30	.85	150	60	.57
100	40	.74	300	44	.47
125	36	.63			

ACETATE PROCESS

Denier	Price	Denier	Price
45	$1.10	100	$0.77½
55–65	1.05	120–125	.68– .73
75	.90	150	.60

CUPRAMMONIUM PROCESS (TWISTED)

Denier	Filament	Price	Denier	Filament	Price
30	24	$1.40	100	75	$0.79
75	60	.90	150	112	.60